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CHEMICAL AND PHYSICAL CHARACTERISTICS OF SNOW IN THE KEJIMKUJIK NATIONAL PARK AREA IN 1985-86

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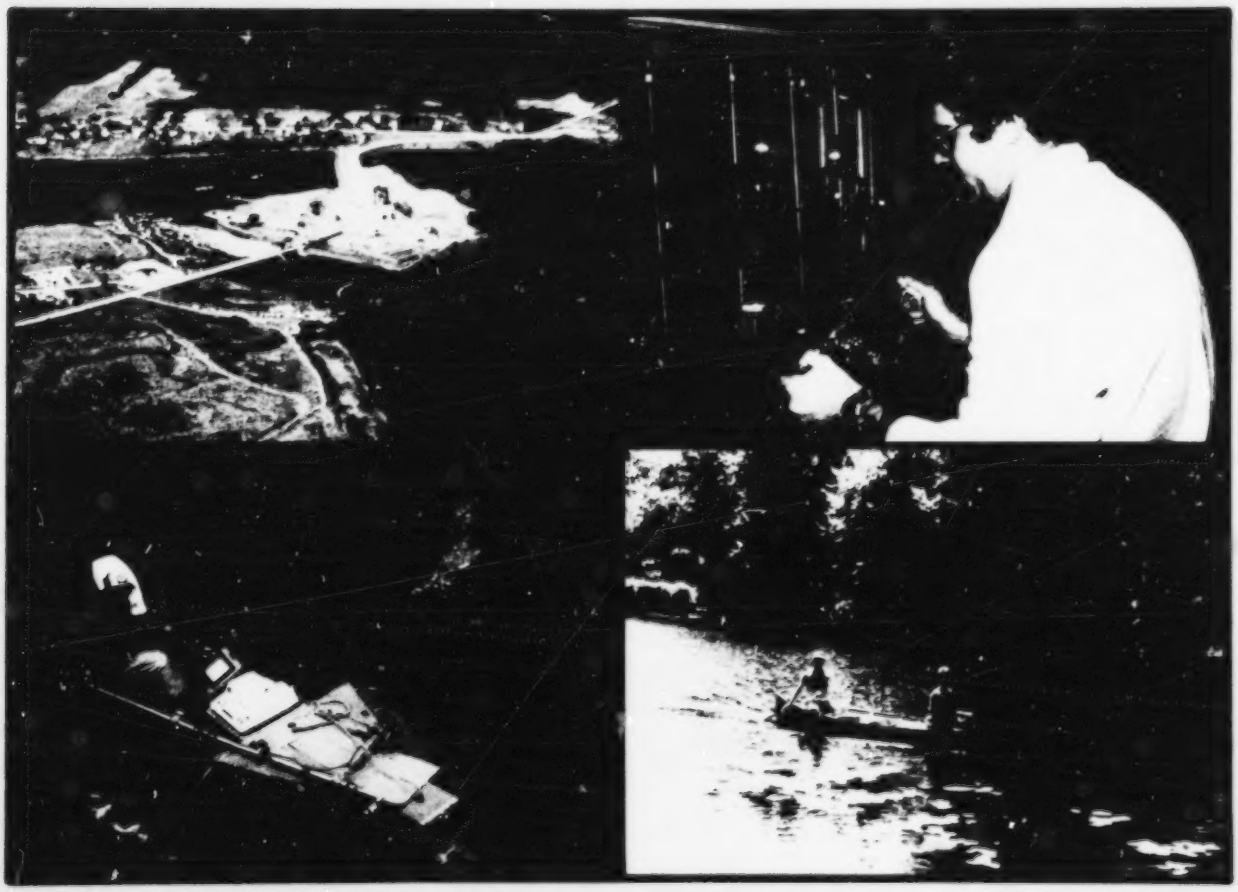

Canada

INLAND WATERS DIRECTORATE
ATLANTIC REGION
WATER QUALITY BRANCH
MONCTON, NEW BRUNSWICK

Chemical and Physical Characteristics of Snow in the Kejimkujik National Park Area in 1985-86

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Technical Report IW/L-AR-WQB-87-122

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Abstract and Management Perspective

Fifteen snow samples were collected weekly along each of two, 150 m long transects, and collected once along a third transect, in the upper Mersey River basin in south-western Nova Scotia, from December 16, 1985 to March 21, 1986. The first transect (Site A) was situated at the CAPMon atmospheric sampling site, the second (Site B) was 35 km upstream at the headwaters area of the basin, and the third (Site C) was approximately 1 km north of Site B. Snowpack depth and water content were significatively different between Site A and B during the sampling period. Snow chemistry was influenced somewhat by seaspray, as the headwaters site, located 30 km from the Bay of Fundy, showed higher concentrations for magnesium and sodium before the seasalt correction was done. The data show that nitric acid is more concentrated than sulfuric in the snowpack at both sites. These data can be used too as input into the calibration and validation of hydrological and chemical models of the upper Mersey River which will allow a more efficient interpretation of the implications of snowmelt on potential short-term water quality changes.

Résumé et perspectives de gestion

Quinze échantillons de neige furent collectionnés le long de trois transects de 150 m dans le bassin de la rivière Mersey au sud-ouest de la Nouvelle-Écosse. Deux des sites furent échantillonnés à chaque semaine pendant la période du 16 décembre 1985 au 21 mars 1986, tandis que le troisième (Site C) ne fut échantillonné qu'une seule fois. Site A était situé près de la station d'échantillonnage atmosphérique de Kejimkujik, Site B était dans la région des lacs primaires du bassin et Site C était environ à 1 km au nord du Site B. La profondeur et le contenu d'eau de la neige étaient supérieurs au Site B pendant la période étudiée. Certains characteristiques chimiques, soit les ions de magnésium et de sodium, furent influencés par l'écume marine provenant de la Baie de Fundy et de l'Océan Atlantique au Site B surtout. Aussi, nos données démontrent que les acides nitriques sont plus concentrés que les acides sulfuriques dans la neige de la région. Ces données peuvent maintenant être utilisées dans l'élaboration de modèles hydrologiques et chimiques de la partie supérieure de la rivière Mersey. Il est aussi possible de mieux comprendre les effects des fontes de neige sur les changements à court terme de la qualité des eaux de la région.

Introduction

Snowmelt has been identified as one of the most important modifiers of stream and river chemistry in temperate and boreal regions of North America and Europe (Jeffries, et al., 1979; Cadle, et al., 1984; Johannessen, et al., 1980). Evidence from stream chemistry in southwestern Nova Scotia (Clair and Freedman, 1986) also shows similar effects, as ions deposited in the snowpack are released into streams during snowmelts, and thus change ion concentrations over a short period of time. Though chemical descriptions of precipitation are available from the CANSAP, APN and CAPMon networks, these are often not suitable for predicting effects on streams, due to a number of physical processes that occur within the snowpack over the period of its existence (Colbeck, 1981).

The Kejimkujik National Park area of Nova Scotia has been the focus of a number of studies by the Water Quality Branch and other agencies, dealing with the chemical quality of local streams and lakes. One gap has been a lack of information on snowpack chemistry, and so an attempt to relate it to water quality and quantity in local basins, until recently, has been impossible. This report continues the work undertaken during the last two years and reported by Clair (1985, 1986). The data presented here will be used in a number of ways. Firstly, the snowpack physical information is necessary for the building of a predictive hydrological model of the Mersey River which is being prepared by

Water Resources Branch (WRB) of the Inland Waters Directorate. Secondly, a complementary model predicting Mersey River water chemistry changes, being done at the National Water Research Institute (NWRI), requires this information to provide a more accurate picture of chemical inputs into the basin waters. Thirdly, the data will also be used to validate a model of snowpack and snowmelt chemistry currently being tested by the Atmospheric Environment Service (Paul Louie, pers. com.). This report will then focus on the results of the snow sampling program conducted at the sites in the upper Mersey River basin between December 1985 and March 1986.

Area and Methods

Two sites, separated from each other by 35 km, were chosen for snow sampling, one (Site A) at the Atmospheric Environment Service (AES) CAPMon precipitation sampling site near the outflow of the upper Mersey River basin, and the other (Site B) near West Springhill on Victoria Road in the headwaters area (Fig. 1). Also, a third site (Site C) was added for this year's study, so that the possibility of contamination by local influences at Site B could be investigated. Since a house was only one kilometer from Site B, Site C was located 1 km to the north, so that the snow would not be influenced by local emissions.

Site A is approximately 110 m above mean sea level (ASL), Site B is at 230 m ASL, and Site C is at 230 m ASL. Site A is roughly equidistant from the Atlantic Ocean and the Bay of Fundy with the Atlantic being 70 km to the south, while the Bay of Fundy is approximately 60 km to the NNW. Site B and Site C are located about 25 km from the Bay of Fundy. The forest cover at Site A was generally comprised of white pine (Pinus strobus) and white spruce (Picea glauca), Site B was dominated by red maple (Acer rubrum) and american beech (Fagus grandifolia), and Site C was mostly covered with balsam fir (Abies balsamea) and spruce (Picea sp.) with some maple (Acer sp.).

At each site, under what was deemed to be representative forest canopy, a 150 m dog-legged transect was laid out, and

sampling locations marked at 10 m intervals, in accordance with the standard AES snow course method. Sampling was done on a weekly basis, more often if possible, at Site A and B, while Site C was sampled only once. As a result of this single sampling, Site C is of limited use in identifying possible local emission effects and thus will only be considered superficially. Water content and snow depth were measured at sites A and B using a Mount Rose snowcore sampler. Snow samples for chemical analysis were taken with a clean 19 cm diameter plexiglass tube, hand-driven into the snowpack. The snow was extruded into clean laminated polyolefin/nylon bags, melted at room temperature and decanted into DECON washed and snowmelt rinsed polyethylene bottles. Samples were then shipped to the Water Quality Branch laboratory in Moncton, where they were analyzed according to methods described in the Analytical Methods Manual. (Anonymous, 1985) (Table 1).

Seasalt corrections for parameters likely to be carried by seaspray were calculated using the method of Watt et al. (1979). Ion balance checks were made on all chemistry samples. Although 15 samples were taken every time at each site, some samples were either lost, or rejected after the analysis. Therefore, some sampling dates will have fewer than 15 values. Finally, the mean and standard deviation values at each site were calculated from the 15 transect values.

Results and Discussion

The results of the study are summarized in Figures 2 to 6 and in Appendix B and C. Also, for the study, atmospheric data were considered, and the climate summaries issued by the Atmospheric Environment Service for the months of December 1985 to March 1986 are included in Appendix A.

The weather in the Mersey River basin during the 1985-86 winter deviated somewhat from long-term averages. As shown in Table 2, temperature, which was measured at the CAPMon site, was lower than usual in December 1985 and February 1986, while snowfall was greater than long-term values only in the month of January. However, because of higher than normal temperatures and the high rainfall (70.1 mm) in January, there was no snowcover from January 21 to January 27 (see Appendix A). This does not correspond to last year's pattern, which had a continuous snowcover throughout the sampling season (Clair, 1986).

Snowpack heights measured at both sites are compared in Figure 2A and indicate that the snow depth at Site B was generally greater than at Site A. No data for snow depth were collected at Site C.

Snow water content values for the sampling dates are shown in Figure 2B and show a pattern similar to snow depth with the highest values being observed at Site B.

Compared to the previous year's data, snowpack accumulation and water content were lower in 1985-86 than in 1984-85 (Clair, 1986), as the irregular snowfall and high rainfall did not permit a great accumulation of snow. Also, there was no increasing compaction of snow since the snow water content generally fluctuated with the snow depth. Decreases in both measurements began at Site B on day 41 (January 10) and on day 23 (December 1985) at Site A and disappeared at both sites on Day 52 (January 21). A second pack appeared on January 29 and the highest snowpack recorded was on February 27 at Site B. The final decrease started on March 13 at Site A and on March 14 at Site B, and the snowcover disappeared completely on Day 117 (March 27) at the two sites (Figure 2A).

Patterns of snowpack ion concentrations tended to follow that of snowpack depth, except that for many parameters, there were apparent differences in values between Site A and B. Figure 3D shows that mean nitrate concentrations were usually higher at Site B, while H^+ (pH), chloride and sulfate showed no consistent differences between the two sites (Figures 3A, B, C and E). The remaining parameters are shown in Appendix B, and indicate that sodium, specific conductance and magnesium had higher values at Site B, while alkalinity, calcium, turbidity and potassium were higher at Site A. Total nitrogen did not differ significantly between the sites (Appendix B).

Two other parameters, DOC and colour (Appendix B), also showed

differences between sites, Site A having higher values than Site B, and most likely indicated vegetation effects and not atmospheric deposition.

As the two sites are situated at different distances from the coast, marine aerosol effects may explain some of the differences in snowpack major ion levels. Ions that can be transported into basins by seaspray include sulfate, calcium, magnesium, potassium, sodium and chloride, and thus it is important to also consider their seasalt corrected values. The results are plotted in Figures 4A, B, C, D and E, and they indicate that mean excess calcium and potassium concentrations were higher at Site A, while sulfate was similar at the two sites. However, magnesium and sodium, which were higher at Site B, showed no significant difference between the sites with the seasalt corrected values, indicating a high percentage of marine derived magnesium and sodium at Site B.

Clair (1986) observed that potassium had higher excess values at Site A, which agrees with the results presented herein. Clair (1986) suggested that the higher corrected values of potassium at Site A could have been due to ion exchange of potassium from coniferous needles, which are more numerous at Site A, but this hypothesis remains unproven.

Despite the insights gained by removing seasalt influence, other factors must be invoked to explain other differences of values between sites. As was suggested by Clair (1986),

differences in pH and nitrate-nitrite could be due to local influences, for example the house 1 km away from Site B or a road 200 m away from Site B. It could also be due to orographic factors influencing NO_3 deposition at the upper part of the watershed, or to mesoscale depositional effects, which were also noted the last two years between the CAPMon site, and a site at Beaverskin Lake (Clair, 1985; Clair, 1986).

A comparison of the relative importance of nitric or sulfuric acid in the snowpack over the winter was made by plotting mean equivalencies of both total nitrate and seasalt corrected sulfate at both sites (Figures 5A and B). In both cases, nitrate was the more important of the two, though values of nitrate were higher at Site B while sulfate was similar at the two sites. These data correspond to the results found by Topol (1986), in which the level of nitrate-nitrite was higher than sulfate. It was also apparent that sites with a lower pH were the ones which had the highest nitrate-nitrite concentrations. Topol (1985) suggested that snow captures HNO_3 vapour very effectively, which explains the high concentration of nitrate-nitrite and the low pH (approximately 4.3 to 5.1) found in our study.

Also, as was observed in last year's study (Clair, 1986), the sum of nitrate-nitrite and sulfate ions was often much higher than the hydrogen ion concentration (Figures 6A and B). As this difference is generally equivalent to the excess calcium and magnesium concentration, it may be that terrestrial inputs of

calcium and magnesium bicarbonate may be providing some buffering potential.

In summary, the snow sampling in 1986 produced data which gave a good assessment of snow quality and quantity, and showed a different pattern of snowpack and snowmelt chemistry from last year's study. Therefore, with further research, the data will allow computer modelling of river quality, in addition to a deeper examination of snowmelt and the "acid shock" it causes in the Mersey River basin in the Kejimkujik National Park area.

Acknowledgements

The authors thank C. Floyd Luxton for taking the snow samples, the staff at Kejimkujik National Park for allowing access to the site and providing the use of their facilities, Atmospheric Environment Service, Downsview for providing sampling equipment, and the staff of the Water Quality Branch - AR laboratory for doing the analyses. F. Melanson typed the report.

References

Anonymous, 1986. NAQUADAT Dictionary of parameter codes. Water Quality Branch, Environment Canada, Ottawa.

Cadle, S.H., J.M. Dasch, and N.E. Grossnickle, 1984. Northern Michigan snowpack - a study of acid stability and release. Atmos. Env. 18:807-816.

Clair, T.A., 1985. Chemical and physical characteristics of snow in the Kejimkujik National Park area in 1983-84. Tech. Rep. IWD-AR-WQB-85-86, Environment Canada, Moncton.

Clair, T.A., 1986. Chemical and physical characteristics of snow in the Kejimkujik National Park area. II Winter 1984-85. Tech. Rep. IWD-AR-WQB-86-95, Environment Canada, Moncton.

Clair, T.A., and B. Freedman, 1986. Patterns and importance of dissolved organic carbon in four acidic brownwater streams in Nova Scotia, Canada, Tech. Rep. IWD-AR-WQB-86-97, Environment Canada, Moncton.

Colbeck, S.C., 1981. A simulation of the enrichment of atmospheric pollutants in snow cover runoff. Water Resources Res. 17:1383-1388.

Jeffries, D.S., C.M. Cox and P.J. Dillon, 1979. Depression of pH

in lakes and streams in Central Ontario during snowmelt. J. Fish. Res. Bd. Canada 36:640-646.

Johannessen, M. and A. Henriksen, 1978. Chemistry of snow meltwater: changes in concentration during melting. Water Resources Res. 14:615-619.

Johannessen, M., A. Skarweit and R.F. Wright, 1980. Streamwater chemistry before, during and after snowmelt. From: D. Drablos, A. Tollan (ed.). Proc. Int. Conf. ecol. impact acid precip., Norway, pp. 224-225.

Topol, L.E., 1986. Differences in ionic compositions and behavior in winter rain and snow. Atmos. Env. 20:347-355.

Watson, W.B., 1977. The climate of Kejimkujik National Park, Nova Scotia. Unpub. manuscript, Atmos. Env. Service, Downsview, Ont.

Watt, W.D., D. Scott and S. Ray, 1979. Acidification and other chemical changes in Halifax County Lakes after 21 years. Limnol. Oceanogr. 24:1154-1161.

TABLE 1: NAQUADAT codes and detection limits of the snow quality parameters reported (Anonymous, 1986).

Parameter	NAQUADAT Code	Units	Detection Limits
pH	10301L	-	N/A
Specific Conductance	02041L	uSie/cm	N/A
Turbidity	02073L	JTU	0
Calcium	20110L	$mg.L^{-1}$	.01
Dissolved Organic Carbon	06107L	$mg.L^{-1}$	.4
Nitrate	07110L	$mg.L^{-1}$	.002
Sulfate - IC	16309L	$mg.L^{-1}$	0.05
Alkalinity (GRAN)	10110L	$mg.L^{-1}$	N/A
Magnesium	12107L	$mg.L^{-1}$	.005
Potassium	19103L	$mg.L^{-1}$	0.1
Sodium	11103L	$mg.L^{-1}$	0.1
Chloride	17205L	$mg.L^{-1}$	0.1
Total nitrogen	07601L	$mg.L^{-1}$	.025

2 : Comparison of mean, mean maximum and mean minimum values measured for temperature and snowfall in 1985-86 to long-term values presented by Watson* (1977) at Kejimkujik National Park.

	December (1985)			January (1986)			February (1986)			March (1986)		
	Mean	Maxi	Mini	Mean	Maxi	Mini	Mean	Maxi	Mini	Mean	Maxi	Mini
ature (°C)												
6	-5.7	-0.6	-10.8	-3.7	1.1	-8.5	-6.6	-1.7	-11.5	-1.0	5.0	-7.1
erm	-2.6	1.2	-6.4	-6.4	-2.3	-10.4	-5.7	-0.5	-10.9	-1.3	3.3	-5.9
snowfall (cm)												
6	47.0			82.0			57.0			25.5		
erm	60.6			62.0			60.5			44.7		

values from Watson (1977) were taken from 1966 to 1971.

FIGURE 1

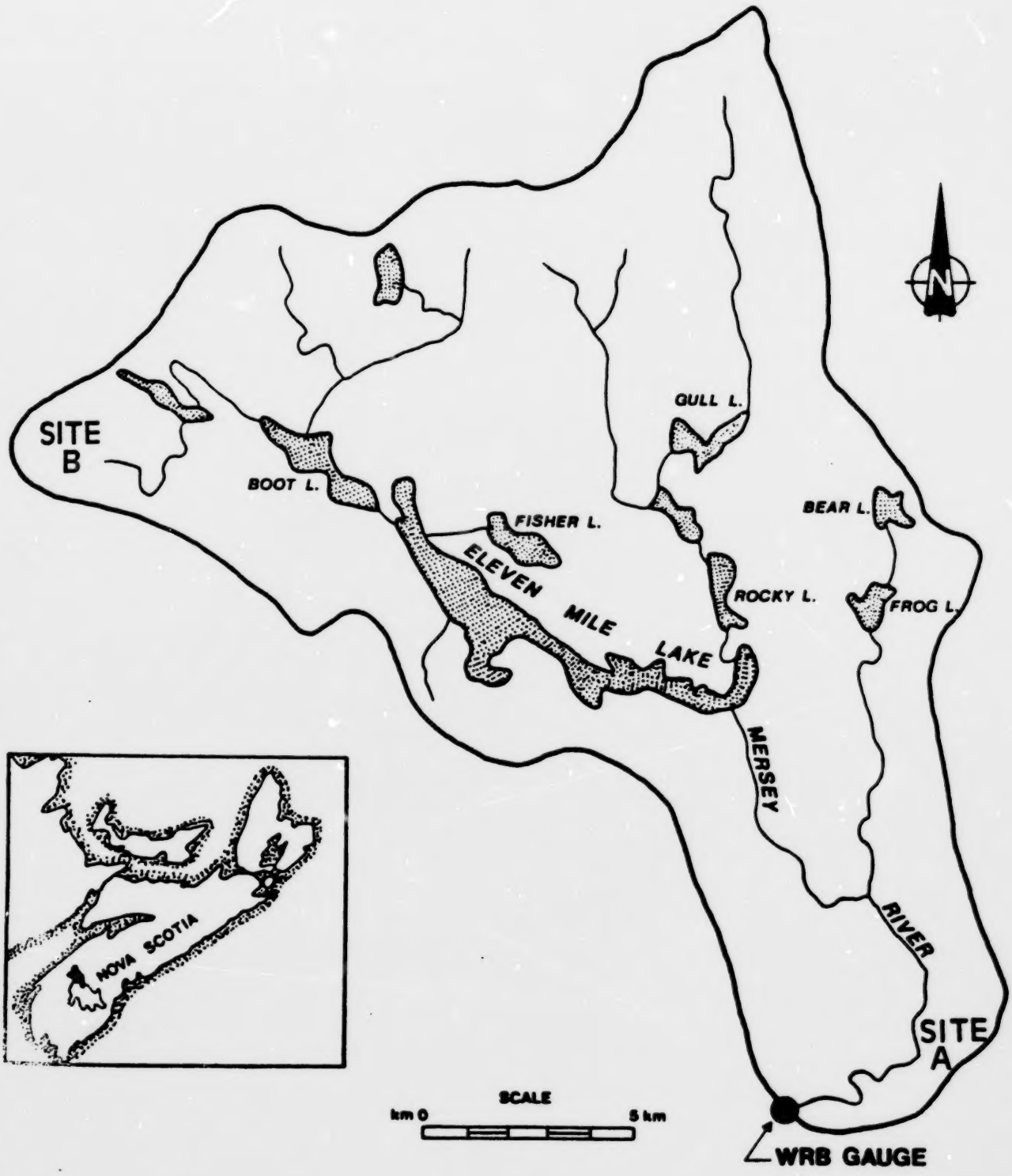

SITE B
BOOT L.
FISHER L.
ELEVEN MILE LAKE
GULL L.
BEAR L.
ROCKY L.
FROG L.
MERSEY RIVER
SITE A
WRB GAUGE
N
NOVA SCOTIA
SCALE
km 0
5 km

FIGURE 2A: MEAN SNOW DEPTH AT STUDY SITES IN 1985-86

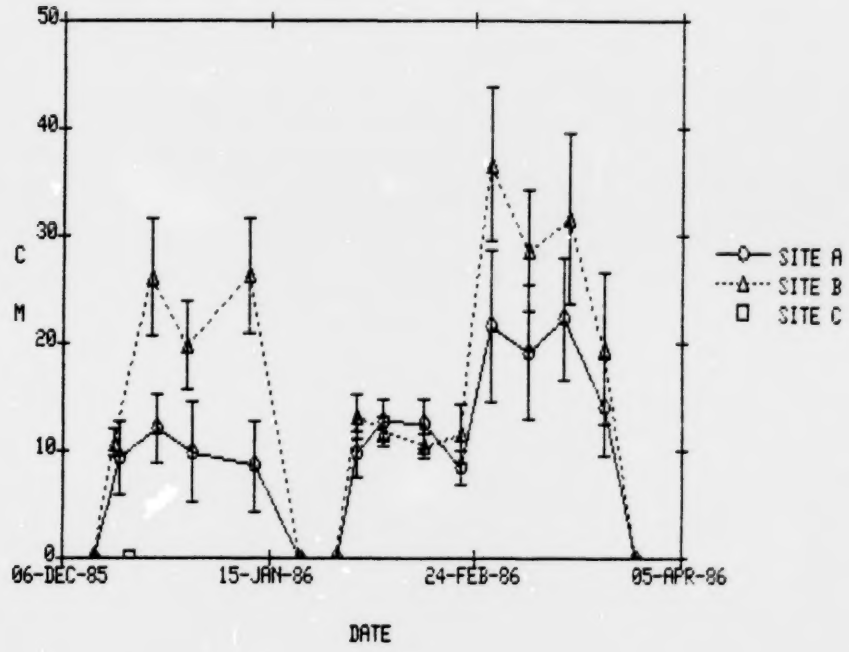


FIGURE 2B: MEAN SNOW WATER CONTENT AT STUDY SITES IN 1985-86

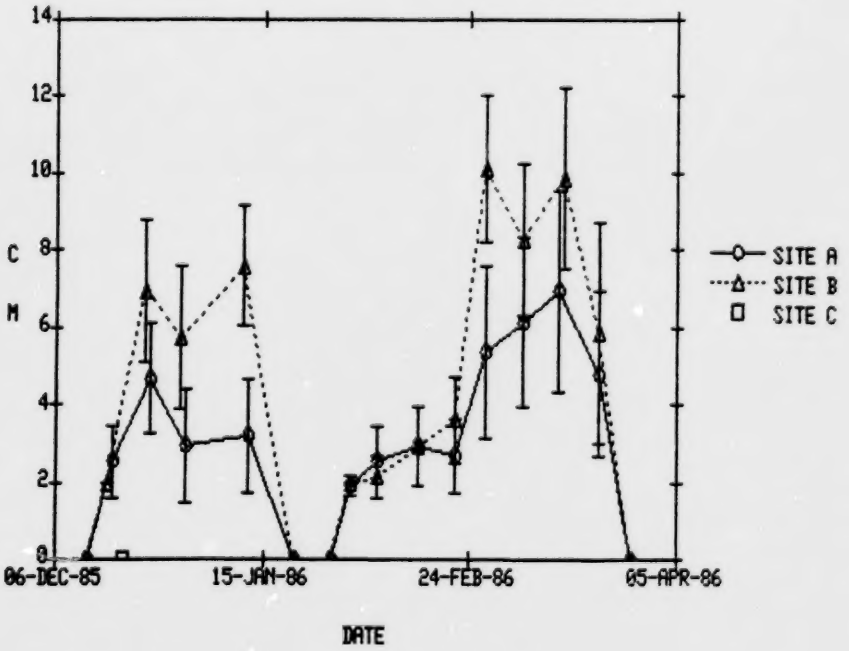


FIGURE 3A: MEAN SNOW HYDROGEN ION CONCENTRATION AT STUDY SITES IN 1985-86

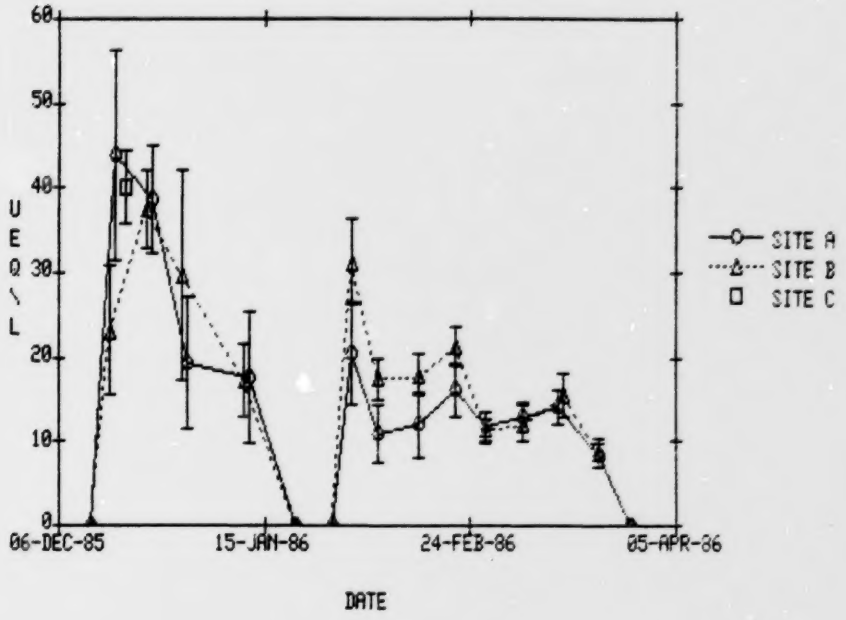


FIGURE 3B: MEAN SNOW CHLORIDE AT STUDY SITES IN 1985-86

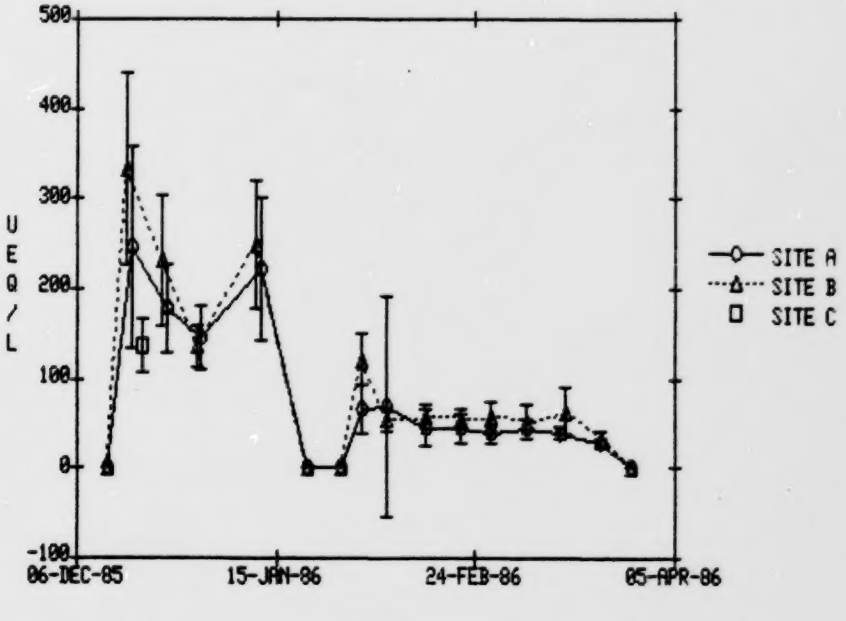


FIGURE 3C: MEAN SNOW SULFATE AT STUDY SITES IN 1985-86

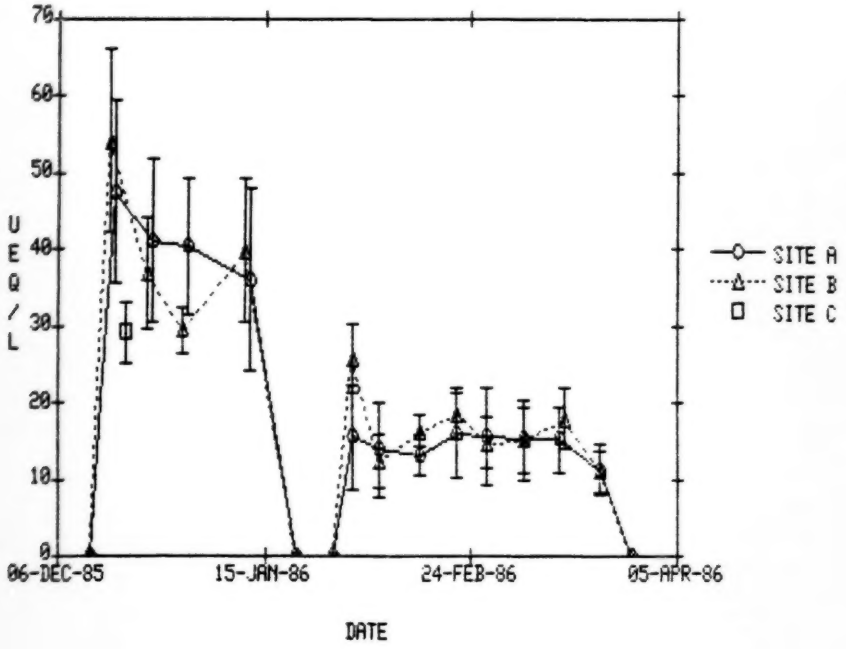


FIGURE 3D: MEAN SNOW NITRATE AT STUDY SITES IN 1985-86

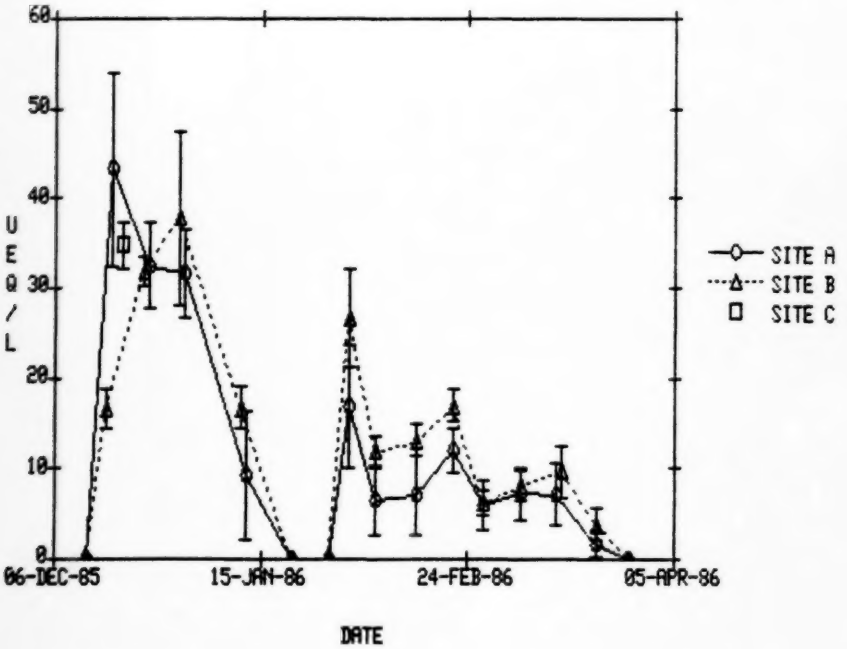


FIGURE 3E: MEAN SNOW PH AT STUDY SITES IN 1985-86

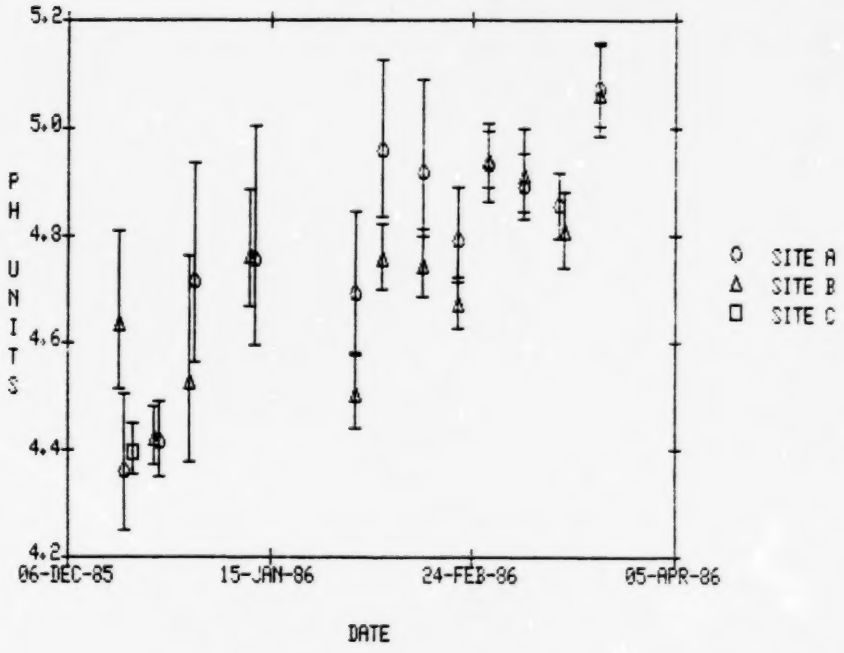


FIGURE 4A: SEASALT CORRECTED SULFATE IN SNOW AT STUDY SITES IN 1985-86

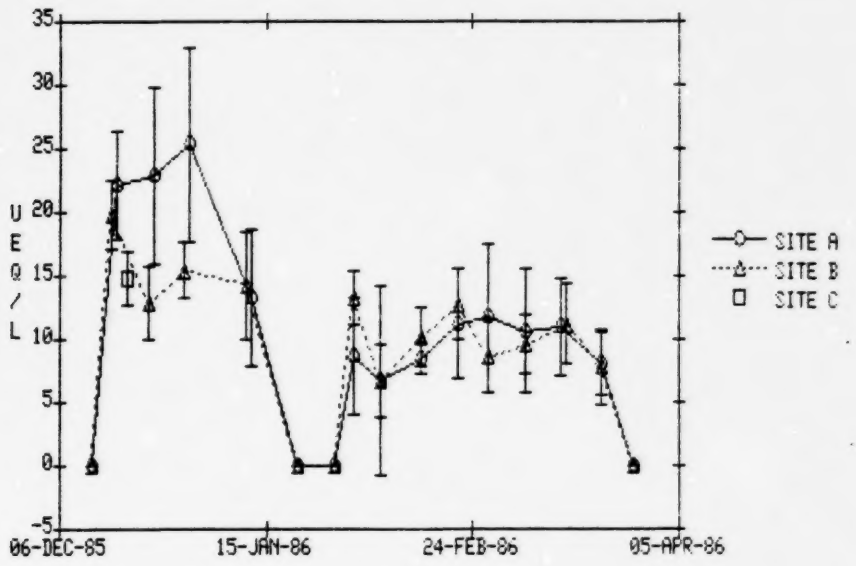


FIGURE 4B: SEASALT CORRECTED CALCIUM IN SNOW AT STUDY SITES IN 1985-86

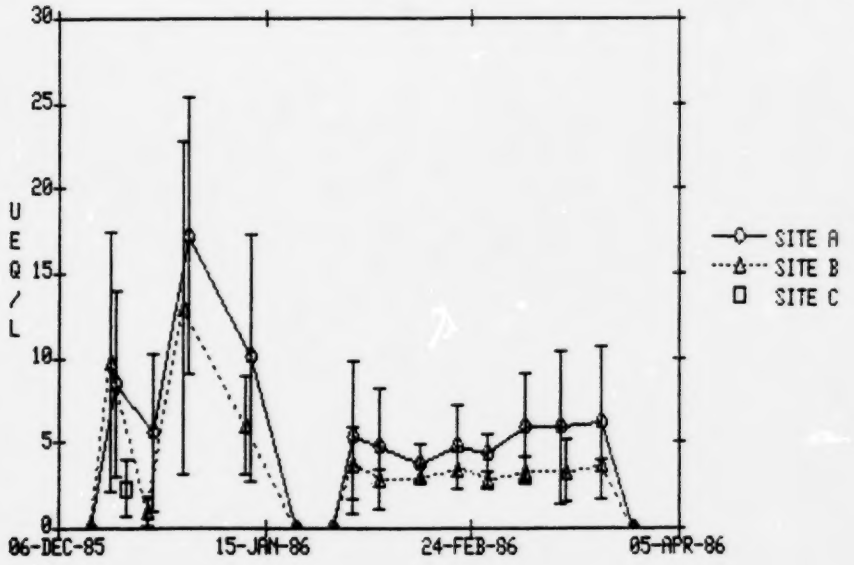


FIGURE 4C: SEASALT CORRECTED MAGNESIUM IN SNOW AT STUDY SITES IN 1985-86

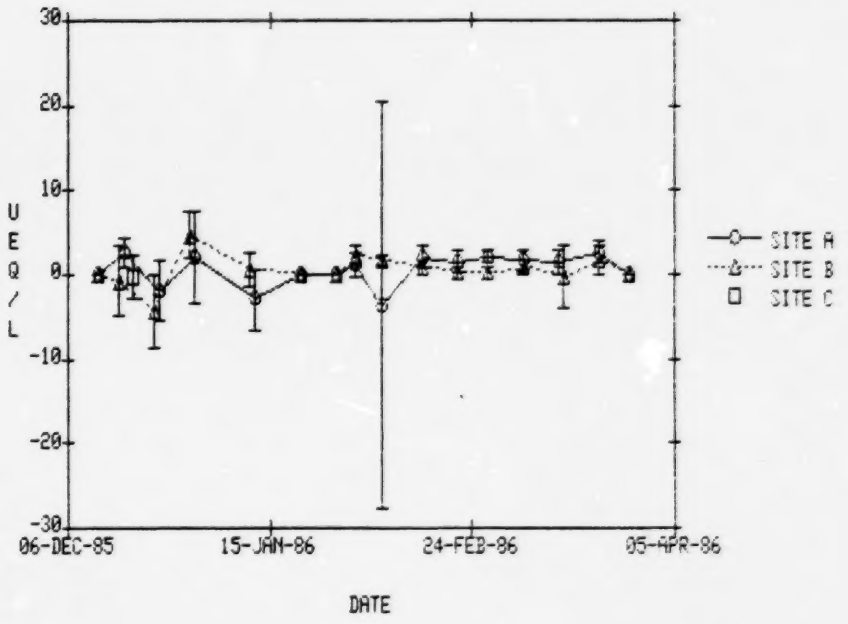


FIGURE 4D: SEASALT CORRECTED POTASSIUM IN SNOW AT STUDY SITES IN 1985-86

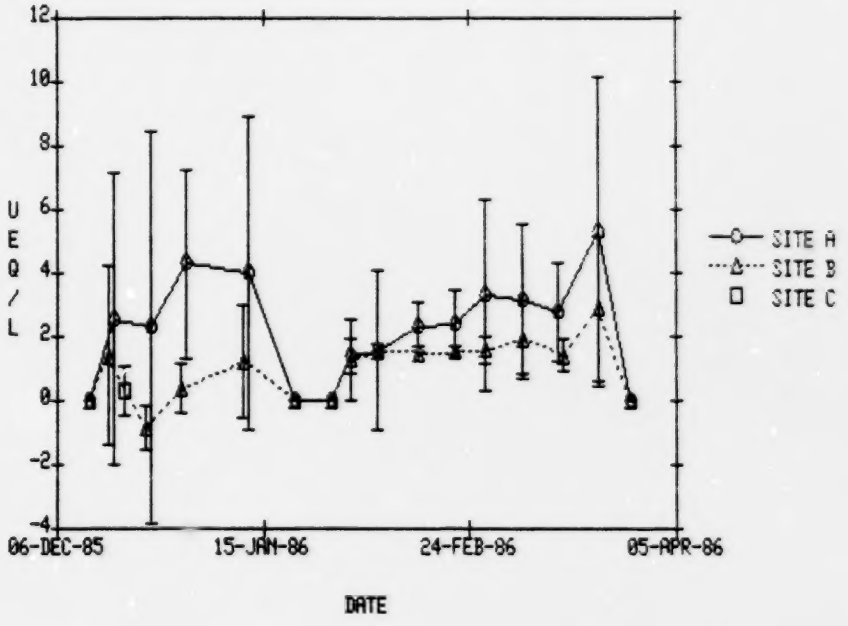


FIGURE 4E: SEASALT CORRECTED SODIUM IN SNOW AT STUDY SITES IN 1985-86

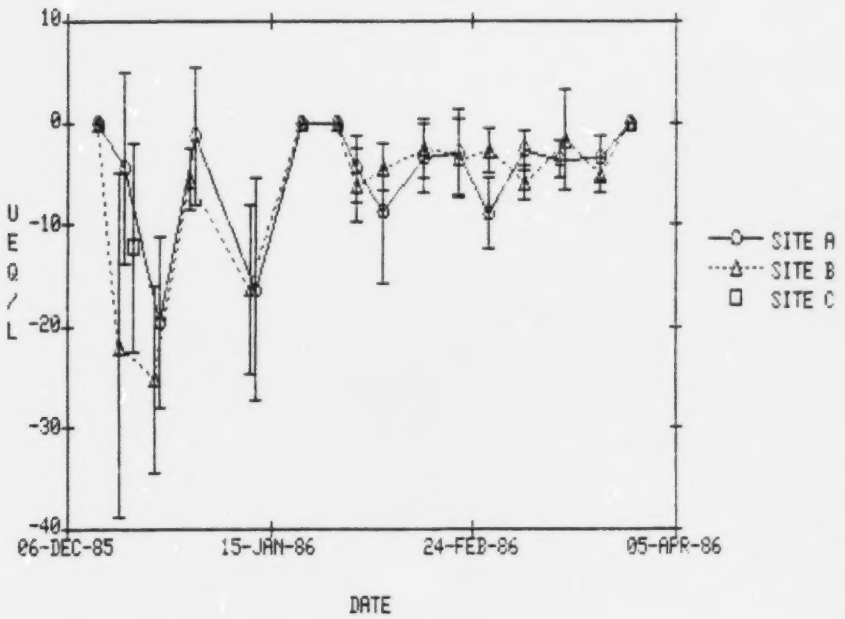


FIGURE 5A: RELATIVE CONCENTRATIONS OF NITRATE-NITRITE AND SULFATE IN THE SNOW AT SITE A IN 1985-86

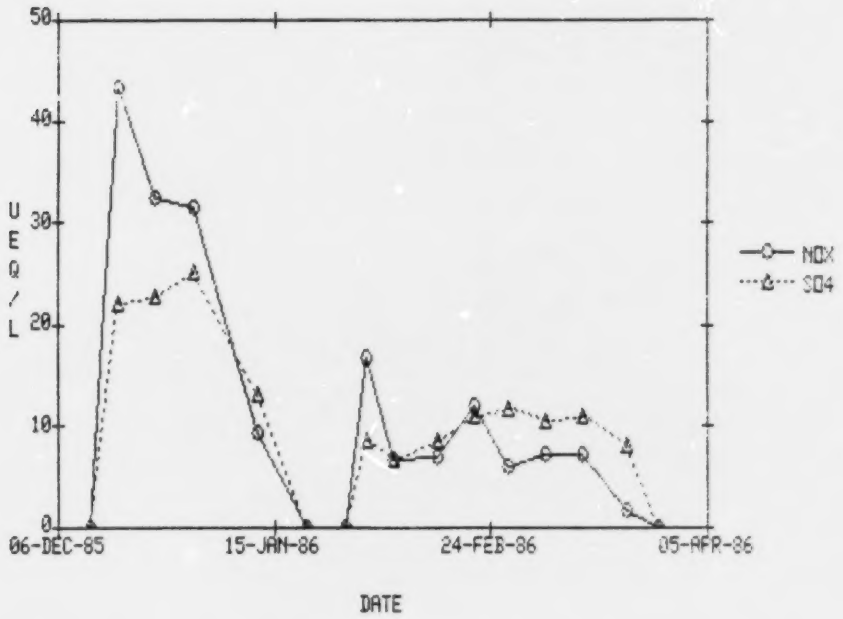


FIGURE 5B: RELATIVE CONCENTRATIONS OF NITRATE-NITRITE AND SULFATE IN THE SNOW AT SITE B IN 1985-86

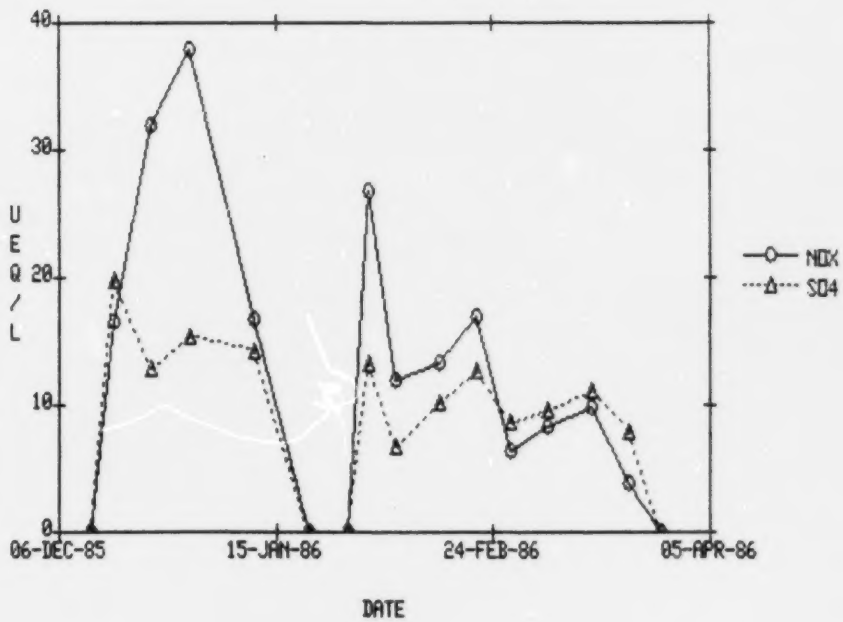


FIGURE 6A: SNOW HYDROGEN VERSUS NOX + SO4 AT SITE A IN 1985-86

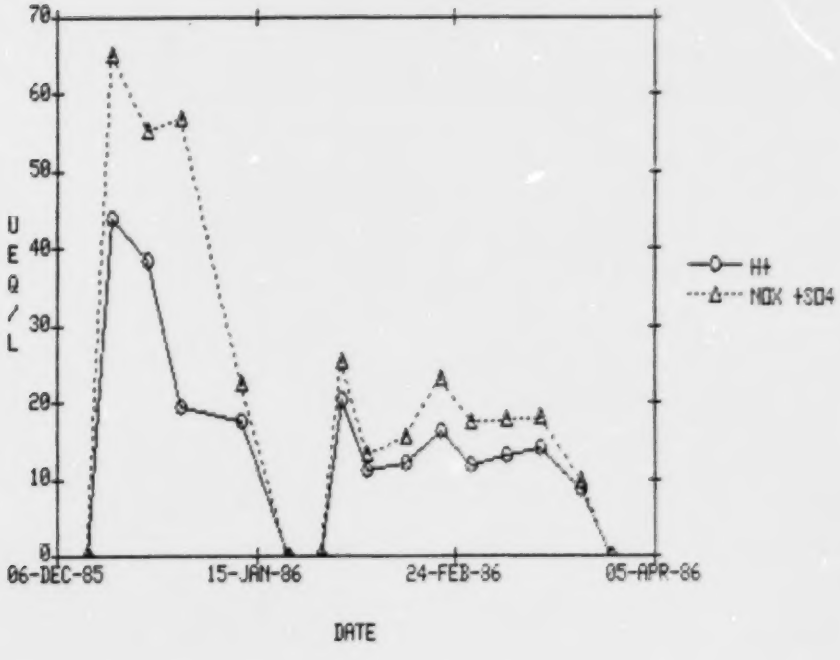
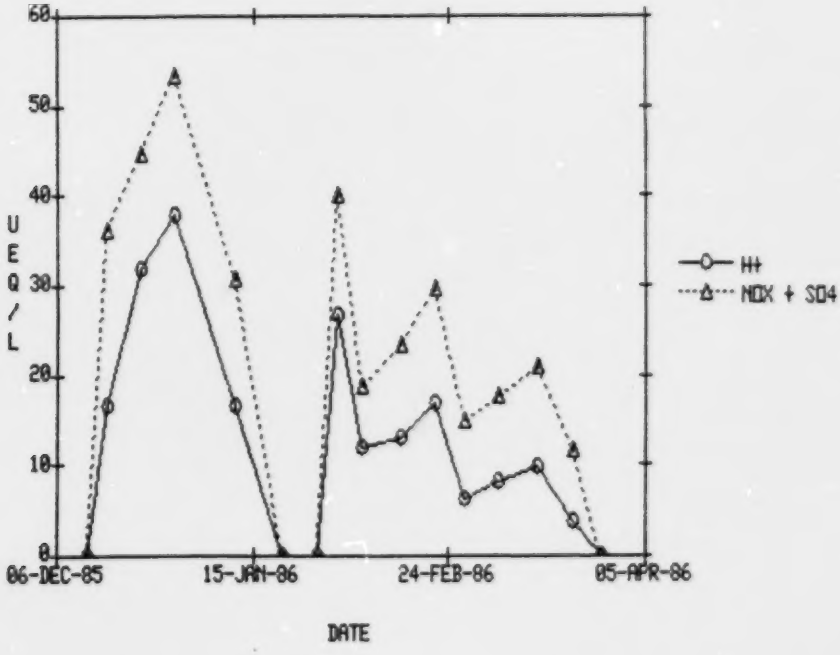


FIGURE 6B: SNOW HYDROGEN VERSUS NOX + SO4 AT SITE B IN 1985-86



Appendix A

Atmospheric Environment Service

Weather Summary for the Kejimkujik

Area over the Sampling Season

(Dec. 1985 to March 1986)

Appendix A - i

Climate Summary for Kejimkujik Park, N. S., December 1985

Day	Temperature Max	Min	Mean	Rain	Total Snow	Pcp	Snow Gnd[2]	Julian Day
1	8.0	-12.5	-2.3	4.2		4.2	2.0	1
2	13.0	-4.0	4.5	22.0	1.0	23.0	0.0	2
3	-2.5	-6.0	-4.3				0.8	3
4	-2.0	-7.0	-4.5				0.2	4
5	-1.0	-11.0	-6.0				0.0	5
6	-.5	-12.5	-6.5				0.0	6
7	-3.0	-10.0	-6.5				0.0	7
8	.5	-10.0	-4.8		2.0	2.0	0.0	8
9	1.0	-7.5	-3.3				2.0	9
10	-.5	-9.0	-4.8				1.6	10
11	-1.5	-11.5	-6.5		2.0	2.0	1.2	11
12	-1.0	-6.5	-3.8		3.0	3.0	5.0	12
13	.5	-15.0	-7.3	T[2]	2.0	2.0	5.8	13
14	1.5	-4.0	-1.3	T	1.0	1.0	8.8	14
15	-8.5	-11.5	-10.0		1.5	1.5	10.0	15
16	0.0	-16.0	-8.0		3.0	3.0	12.6	16
17	0.0	-5.5	-2.8				16.0	17
18	-1.0	-8.5	-4.8		16.0	16.0	22.0	18
19	-11.0	-16.0	-13.5				29.0	19
20	-6.5	-21.5	-14.0				26.0	20
21	-8.5	-16.0	-12.3				25.8	21
22	-6.0	-17.0	-11.5		2.0	2.0	24.0	22
23	1.0	-21.0	-10.0		3.0	3.0	27.8	23
24	4.5	-2.5	1.0				26.6	24
25	9.0	2.0	5.5	3.2		3.2	17.8	25
26	-7.5	-10.5	-9.0				11.4	26
27	0.0	-17.0	-8.5		4.0	4.0	11.0	27
28	-.5	-5.5	-3.0		5.0	5.0	17.4	28
29	0.0	-11.5	-5.8		1.5	1.5	20.4	29
30	-3.0	-10.0	-6.5				17.6	30
31	6.0	-19.0	-6.5	6.0		6.0	17.0	31
Total	-19.5	-333.5		35.4	47.0	82.4		
Mean	-.6	-10.8	-5.7					

Monthly maximum temperature was 13.0 on day 2.
Monthly minimum temperature was -21.5 on day 20.
Highest rainfall was 22.0 on day 2.
Highest snowfall was 16.0 on day 18.

1 - Trace
2 - Data taken at CAPMON Site

Appendix A - ii

Climate Summary for Kejimkujik Park, N. S., January 1986

Day	Temperature			Rain	Total Snow	Pcp	Snow Gnd	Julian Day
	Max	Min	Mean					
1	3.0	-.5	1.3	1.7		1.7	10.2	32
2	-1.0	-12.5	-6.8		T	T	10.2	33
3	3.5	08.0	-2.3	2.5	22.5	25.0	13.4	34
4	-1.5	-10.0	-5.8		2.0	2.0	13.0	35
5	2.5	-14.5	-6.0		5.0	5.0	10.8	36
6	-2.5	-7.0	-4.8		12.0	12.0	12.0	37
7	-9.5	-11.0	-10.3		1.5	1.5	20.4	38
8	-9.0	-14.0	-11.5		3.0	3.0	18.8	39
9	1.0	-14.0	-6.5		.5	.5	20.4	40
10	4.5	-5.5	-.5				20.0	41
11	-2.5	-5.0	-3.8				17.6	42
12	6.0	-17.0	-5.5				19.6	43
13	7.0	0.0	3.5		6.0	6.0	16.0	44
14	-8.0	-13.5	-10.8		1.0	1.0	20.0	45
15	-12.0	-20.0	-16.0		5.5	5.5	16.8	46
16	-8.0	-20.0	-14.0				18.4	47
17	5.5	-19.0	-6.8				18.4	48
18	9.0	-.5	4.3				16.8	49
19	11.5	-4.0	3.8	24.4		24.4	12.2	50
20	11.5	2.0	6.8	10.6		10.6	3.8	51
21	4.5	3.5	4.0	.8		.8	0.0	52
22	7.0	-6.0	.5	.3		.3	0.0	53
23	1.5	-4.0	-1.3				0.0	54
24	-11.5	-14.0	-12.8				0.0	55
25	.5	-19.0	-9.3		T	T	0.0	56
26	11.0	-10.5	.3	11.2		11.2	0.0	57
27	13.0	5.0	9.0	18.4		18.4	0.0	58
28	10.0	2.5	6.3	.2	5.0	5.2	0.0	59
29	-3.5	-8.0	-5.8		2.0	2.0	8.0	60
30	-5.0	-7.5	-6.3		12.0	12.0	7.6	61
31	-5.0	-11.0	-8.0		4.0	4.0	14.8	62
Total	33.5	-263.0		70.1	82.0	152.1		
Mean	1.1	-8.5	-3.7					

Monthly maximum temperature was 13.0 on day 27
Monthly minimum temperature was -20.0 on day 15; 16
Highest rainfall was 24.4 on day 19
Highest snowfall was 22.5 on day 3

Appendix A - iii

Climate Summary for Kejimkujik Park, N. S., February 1986

Day	Temperature Max	Min	Mean	Rain	Total Snow	Pcp	T H	Z R	H A	Snow Gnd	Julian Day
1	-7.5	-15.5	-11.5		1.5	1.5				14.0	63
2	.5	-18.0	-8.8		13.0	13.0				15.6	64
3	-5.0	-7.0	-6.0							23.0	65
4	-3.0	-21.5	-12.3		4.0	4.0				21.8	66
5	1.0	-20.0	-9.5	.3	5.0	5.3				27.0	67
6	-4.0	-11.0	-7.5							25.4	68
7	-6.5	-16.0	-11.3							25.4	69
8	-2.5	-17.5	-10.0							25.4	70
9	-1.5	-9.5	-5.5							23.0	71
10	-.5	-6.5	-3.5							22.6	72
11	-1.5	-15.5	-8.5							22.0	73
12	-2.5	-7.0	-4.8							23.0	74
13	-4.5	-23.0	-13.8		T	T				22.0	75
14	-2.0	-17.5	-9.8		2.0	2.0				23.0	76
15	-1.0	-6.5	-3.8		1.5	1.5				25.0	77
16	-3.5	-8.5	-6.0							26.0	78
17	-3.0	-17.0	-10.0		2.0	2.0				25.0	79
18	-2.5	-9.5	-6.0							27.0	80
19	-.5	-6.0	-3.3							26.0	81
20	5.5	-13.0	-3.8							26.0	82
21	5.0	-15.0	-5.0		12.0	12.0				23.0	83
22	.5	-1.5	-.5	1.0		1.0				38.0	84
23	-2.0	-6.0	-4.0		5.0	5.0				32.0	85
24	-1.0	-5.5	-4.0							35.0	86
25	-1.5	-4.0	-2.8	T	7.5	7.5		X		32.0	87
26	-2.5	-5.5	-4.0		3.5	3.5				43.0	88
27	-.5	-9.0	-4.8							46.0	89
28	-1.0	-10.0	-5.5							39.0	90
Total	-47.5	-322.5		1.3	57.0	58.3	010				
Mean	-1.7	-11.5	-6.6								

Monthly maximum temperature was 5.5 on day 20
Monthly minimum temperature was -23.0 on day 13
Highest rainfall was 1.0 on day 22
Highest snowfall was 13.0 on day 2

Appendix A - iv

Climate Summary for Kejimkujik Park, N. S., March 1986

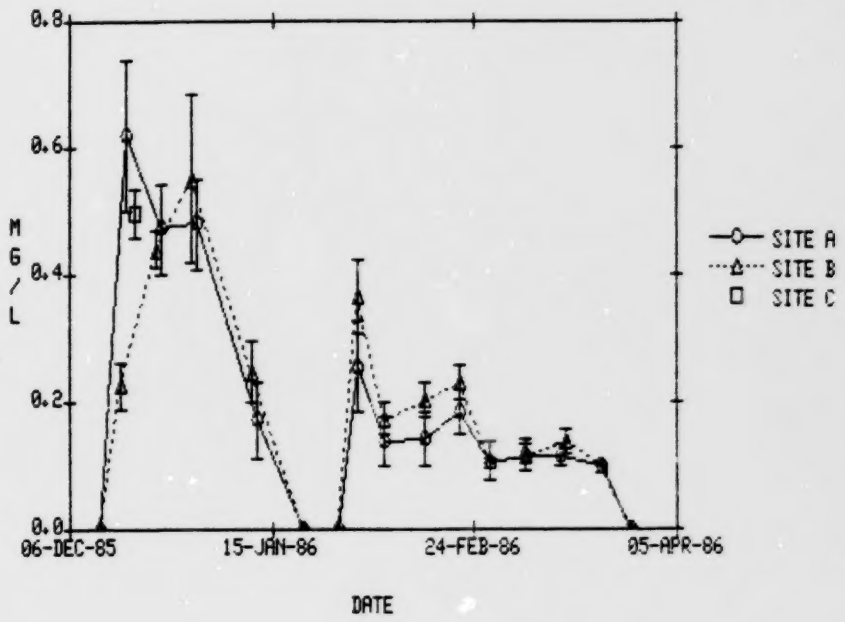
Day	Temperature Max	Min	Mean	Rain	Total Snow	Pcp	Snow Gnd	Julian Day
1	4.0	-6.0	-1.0				39.0	91
2	0.0	-3.5	-1.8				36.0	92
3	2.0	-15.5	-6.8				35.0	93
4	6.0	-16.0	-5.0				35.0	94
5	3.0	-7.0	-2.0				34.0	95
6	1.5	-6.5	-2.5		12.0	12.0	34.0	96
7	-.5	-4.5	-2.5		5.0	5.0	54.0	97
8	-8.0	-13.0	-10.5		.5	.5	54.0	98
9	-6.0	-13.5	-9.8		1.5	1.5	51.0	99
10	2.0	-19.5	-8.8		2.5	2.5	52.0	100
11	9.0	-10.5	-.8	7.6	.5	8.1	52.0	101
12	-.5	-8.0	-4.3				40.0	102
13	3.5	-19.5	-8.0		3.5	3.5	40.0	103
14	.5	-2.5	-1.0	16.0		16.0	44.0	104
15	1.5	-2.0	-.3	12.8		12.8	41.0	105
16	3.5	-4.0	-.3				39.0	106
17	5.0	-2.5	1.3				27.0	107
18	7.5	-10.0	-1.3				34.0	108
19	10.0	-3.5	3.3	44.8		44.8	33.0	109
20	6.0	.5	3.3		T	T	19.0	110
21	-5.5	-15.5	-10.5				16.0	111
22	1.5	-18.5	-8.5				16.0	112
23	5.5	-15.0	-4.8				16.0	113
24	8.5	-4.0	2.3				14.0	114
25	8.5	-7.0	.8				10.0	115
26	17.0	0.0	8.5				6.0	116
27	17.5	7.0	12.3	10.2		10.2	0.0	117
28	2.5	-2.0	.3	1.0		1.0	0.0	118
29	13.0	-5.0	4.0				0.0	119
30	22.5	-1.0	10.8				0.0	120
31	15.0	8.5	11.8				0.0	121
Total	156.0	-219.5		92.4	25.5	117.9		
Mean	5.0	-7.1	-1.0					

Monthly maximum temperature was 22.5 on day 30
Monthly maximum temperature was -19.5 on day 10; 13
Highest rainfall was 44.8 on day 19
Highest snowfall was 12.0 on day 6

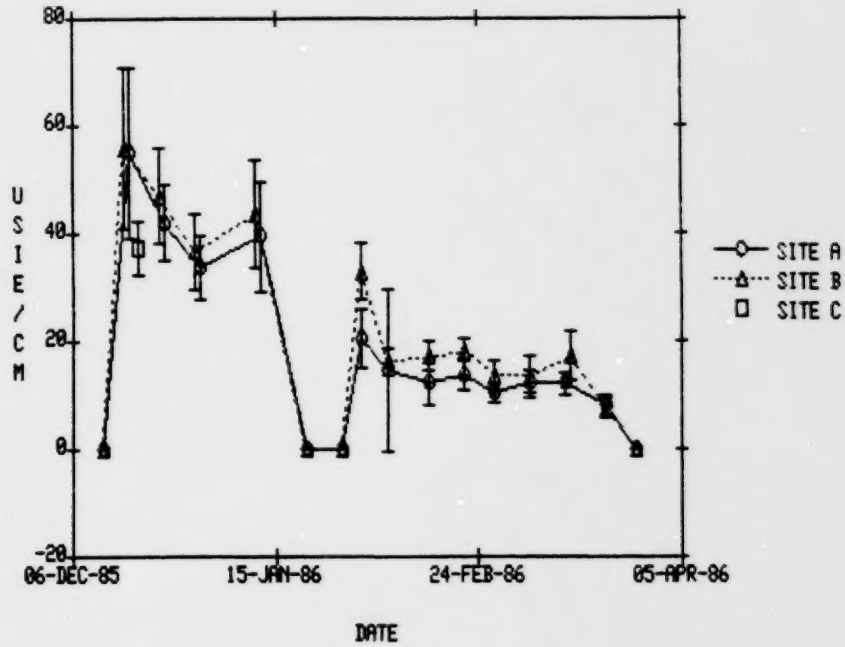
Appendix B

Mean and Standard Deviation of Parameter Values of Snow at Kejimkujik Area over the Sampling Season (Dec. 1985 to March 1986)

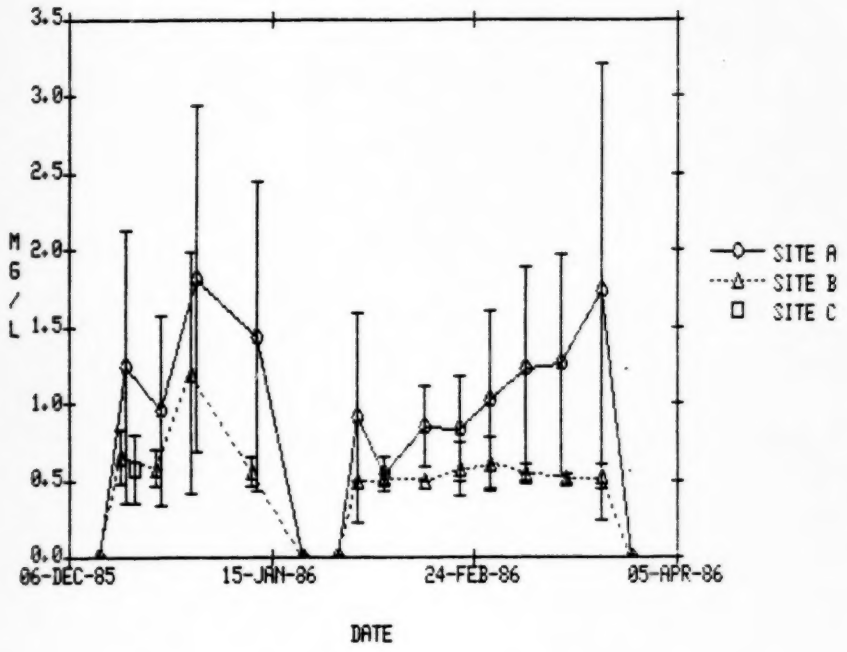
APPENDIX BI: MEAN SNOW TOTAL NITROGEN AT STUDY SITES IN 1985-86



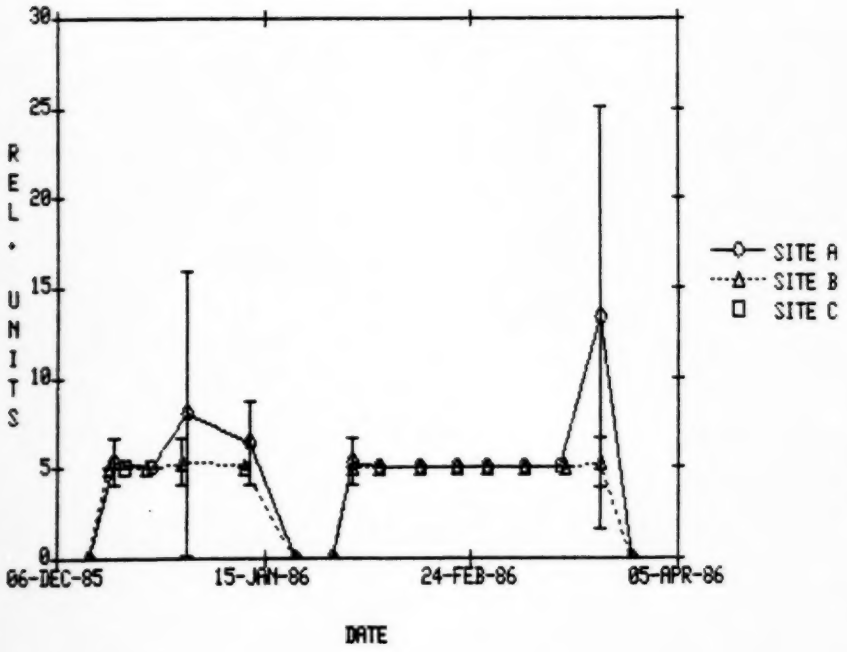
APPENDIX BII: MEAN SNOW CONDUCTANCE AT STUDY SITES IN 1985-86



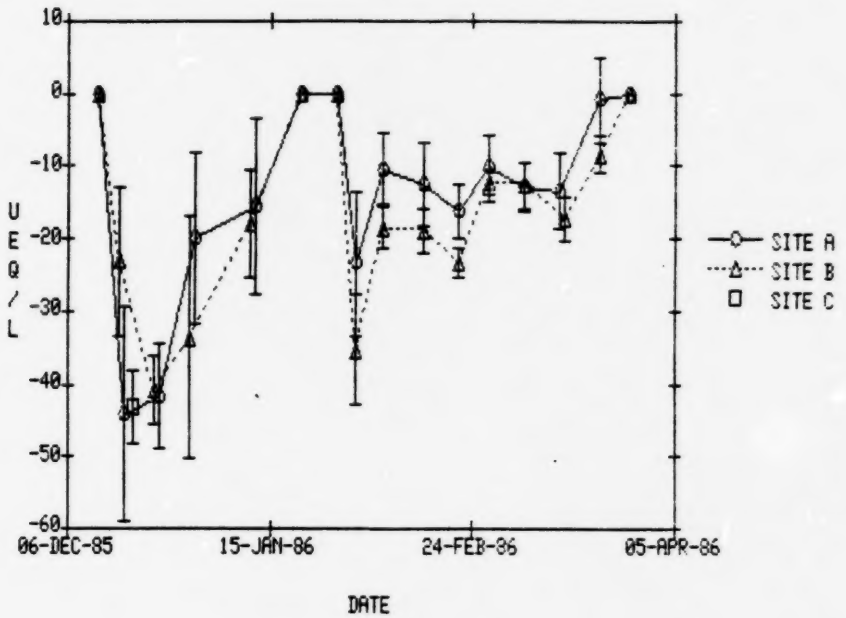
APPENDIX BIII: MEAN SNOW DOC AT STUDY SITES IN 1985-86



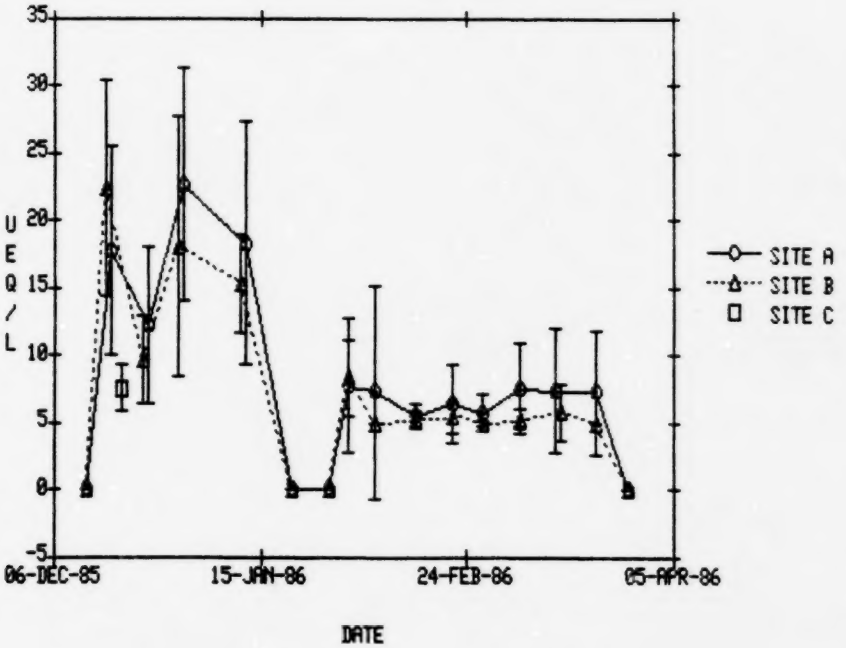
APPENDIX BIV: MEAN SNOW COLOUR AT STUDY SITES IN 1985-86



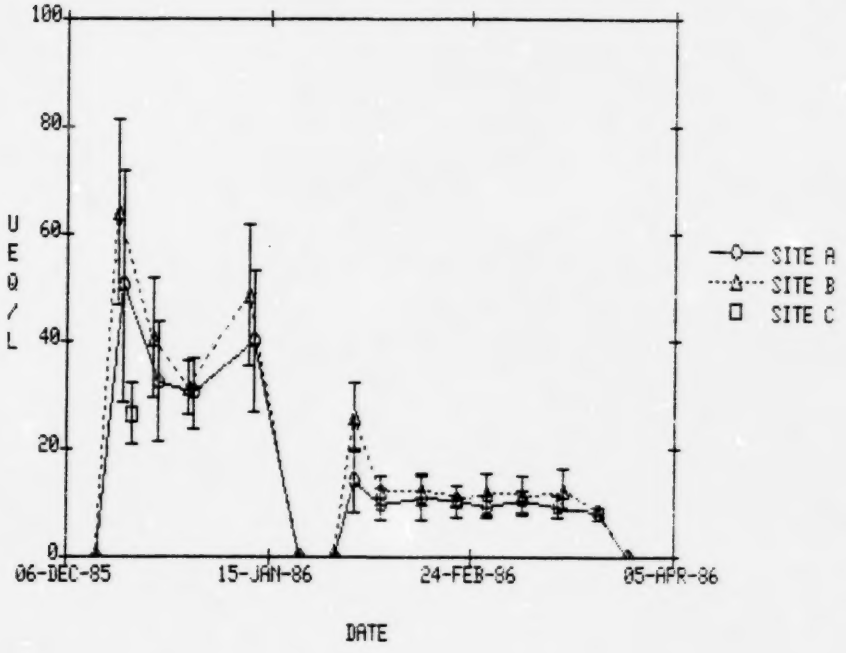
APPENDIX BV: MEAN SNOW GRAN ALKALINITY AT STUDY SITES IN 1985-86



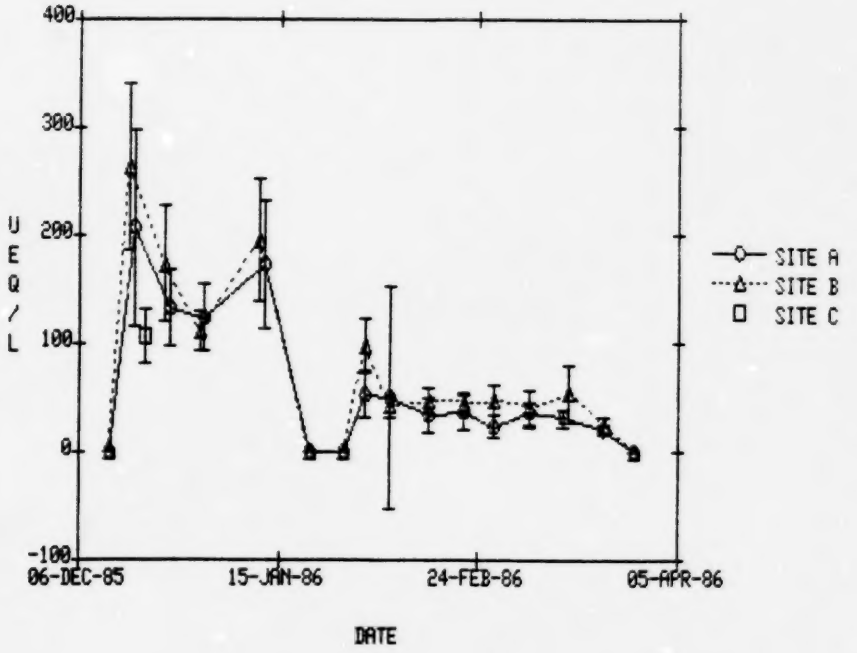
APPENDIX BVI: MEAN SNOW CALCIUM AT STUDY SITES IN 1985-86



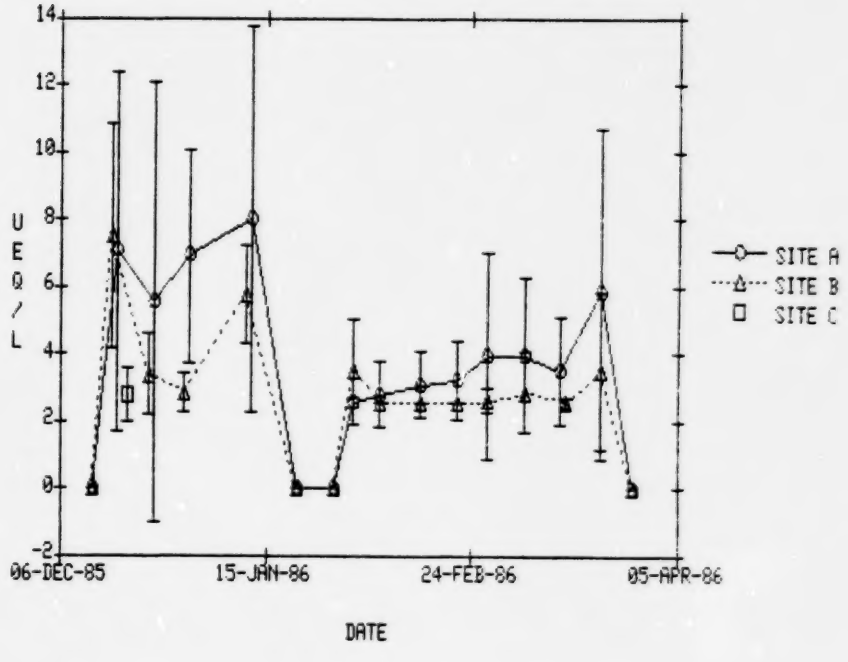
APPENDIX BVII: MEAN SNOW MAGNESIUM AT STUDY SITES IN 1985-86



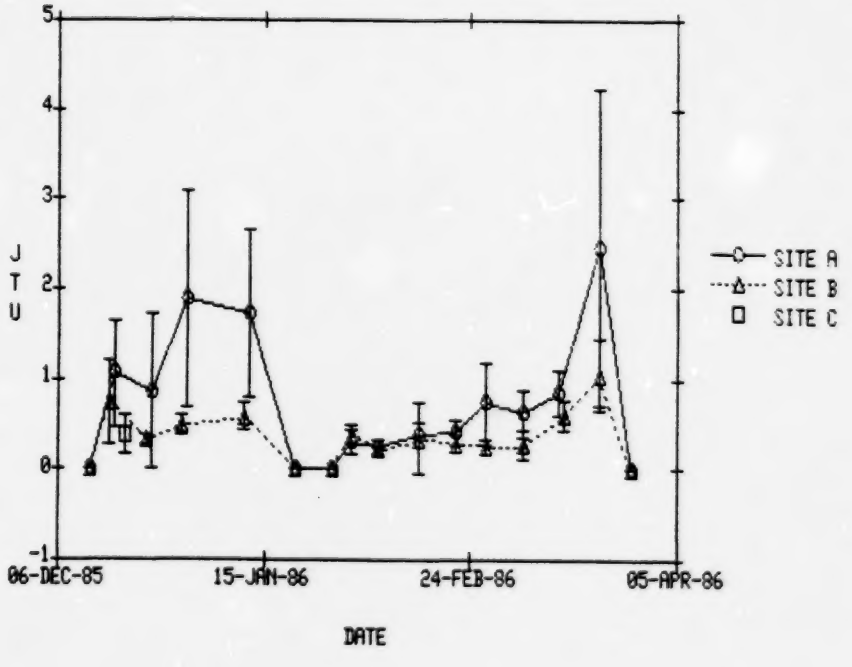
APPENDIX BVIII: MEAN SNOW SODIUM AT STUDY SITES IN 1985-86



APPENDIX BIX: MEAN SNOW POTASSIUM AT STUDY SITES IN 1985-86



APPENDIX BX: MEAN SNOW TURBIDITY AT STUDY SITES IN 1985-86



Appendix C

Raw Data of Chemical and Physical Characteristics of the Snow at Kejimkujik Area during the 1985-86 Sampling Program

SITE A SNOW CHEMISTRY AND WATER CONTENT ON DEC. 17, 1985
(VALUES IN UEQ/L)

STN	H+	COLOUR R.U.	SP.COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	39.8	5	54.0	0.6	16.0	0.5	38.6	47.8	45.8	-42.0	52.7	4.6	208.8	262.3	0.58	12.0	2.0
2	50.1	5	72.0	2.0	22.0	1.7	40.0	62.4	62.4	-48.0	74.9	8.4	304.5	377.9	0.58	14.0	4.0
3	39.8	5	72.0	1.4	33.9	1.5	41.4	66.6	64.5	-38.0	76.5	9.0	326.3	380.7	0.60	6.0	2.0
4	63.1	5	59.0	0.6	11.5	0.8	71.4	47.8	49.9	-62.0	46.1	3.6	182.7	214.3	0.90	8.0	2.0
5	50.1	5	73.0	1.8	21.0	1.3	42.1	60.3	49.9	-52.0	74.1	8.4	304.5	366.6	0.62	8.0	2.0
6	50.1	5	70.0	1.6	22.0	1.2	49.3	60.3	58.2	-50.0	68.3	8.2	274.1	321.5	0.71	6.0	2.0
7	50.1	5	78.0	1.0	19.0	1.1	48.6	62.4	62.4	-56.0	77.4	8.4	317.6	386.3	0.70	8.0	2.0
8	39.8	5	46.0	0.5	10.0	0.6	30.7	41.6	41.6	-40.0	42.8	3.1	169.7	200.2	0.45	8.0	2.0
9	63.1	5	44.0	0.4	11.0	0.8	52.8	31.2	35.4	-62.0	23.0	2.6	100.1	118.4	0.75	14.0	4.0
10	39.8	5	33.0	0.8	15.0	1.2	42.1	31.2	33.3	-40.0	22.2	2.6	82.7	95.9	0.61	10.0	2.0
11	50.1	5	60.0	0.7	15.0	1.5	44.3	54.1	56.2	-54.0	51.0	6.4	230.6	262.3	0.63	6.0	2.0
12	39.8	5	36.0	0.4	5.5	0.8	40.7	27.0	29.1	-46.0	20.6	2.6	91.4	95.9	0.58	14.0	4.0
13	25.1	5	32.0	0.7	16.5	0.8	40.0	31.2	33.3	-24.0	31.3	13.6	121.8	141.0	0.57	14.0	4.0
14	15.8	10	56.0	2.1	32.4	4.2	22.1	68.6	54.1	-4.0	66.7	22.3	274.1	344.0	0.38	6.0	2.0
15	39.8	5	39.0	1.3	16.5	0.6	45.0	37.4	37.4	-46.0	28.0	2.6	113.1	126.9	0.63	6.0	2.0

** DETECTION LIMITS **

COLOUR	- 5.0
DOC	- .5
CA	- 5.0
SO4(MTB)	- 20.8
SO4(IC)	- 10.4
MG	- 8.2
K	- 2.6

SITE A SNOW CHEMISTRY AND WATER CONTENT ON DEC. 24, 1985
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	39.8	5	41.0	0.3	8.5	0.5	34.3	37.4	33.3	-42.0	31.3	2.6	130.5	174.8	0.49	20.0	4.0
2	50.1	5	58.0	1.3	18.5	2.6	40.7	62.4	62.4	-54.0	54.3	6.4	195.8	262.3	0.61	10.0	2.0
3	31.6	5	39.0	1.0	20.5	1.4	28.6	43.7	41.6	-36.0	32.1	5.1	121.8	157.9	0.42	10.0	4.0
4	39.8	5	53.0	1.4	22.0	1.4	37.1	60.3	58.2	-42.0	47.7	9.0	182.7	259.4	0.56	10.0	4.0
5	39.8	5	43.0	0.3	8.0	0.5	34.3	33.3	35.4	-48.0	31.3	2.8	130.5	177.7	0.48	10.0	2.0
6	39.8	5	49.0	0.4	13.0	0.6	35.7	39.5	39.5	-44.0	43.6	3.3	178.4	231.2	0.51	14.0	6.0
7	39.8	5	38.0	0.3	6.5	0.5	32.8	31.2	31.2	-44.0	25.5	2.6	108.8	143.8	0.49	14.0	6.0
8	39.8	5	35.0	0.6	8.0	0.8	32.1	33.3	35.4	-44.0	21.4	3.1	87.0	115.6	0.45	16.0	6.0
9	39.8	5	44.0	0.8	11.5	1.2	33.6	39.5	41.6	-44.0	35.4	5.6	139.2	183.3	0.49	12.0	6.0
10	39.8	5	43.0	3.5	14.5	0.8	34.3	43.7	45.8	-42.0	31.3	4.4	134.9	183.3	0.51	8.0	4.0
11	39.8	5	38.0	0.3	11.0	0.5	32.1	33.3	35.4	-44.0	14.8	2.6	117.5	141.0	0.45	10.0	4.0
12	39.8	5	41.0	0.4	9.0	0.6	32.1	37.4	41.6	-40.0	31.3	2.6	126.2	172.0	0.45	14.0	6.0
13	39.8	5	33.0	0.3	6.0	0.5	30.7	31.2	29.1	-42.0	22.2	2.6	87.0	118.4	0.43	12.0	6.0
14	39.8	5	32.0	0.5	6.0	0.6	30.7	31.2	29.1	-40.0	20.6	2.6	78.3	110.0	0.43	10.0	6.0
15	20.0	5	43.0	1.6	22.0	1.8	19.3	62.4	58.2	-20.0	44.4	28.2	165.3	222.8	0.30	10.0	4.0

** DETECTION LIMITS **

COLOUR	- 5.0
DOC	- .5
CA	- 5.0
SO4(MTB)	- 20.8
SO4(IC)	- 10.4
MG	- 8.2
K	- 2.6

SITE A SNOW CHEMISTRY AND WATER CONTENT ON DEC. 31, 1985
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	25.1	5	39.0	0.7	23.5	0.5	37.8	41.6	41.6	-30.0	37.0	5.4	134.9	169.2	0.55	16.0	4.0
2	15.8	5	40.0	3.0	27.4	1.8	32.8	41.6	41.6	-18.0	32.9	5.4	174.0	194.6	0.50	6.0	2.0
3	25.1	5	33.0	1.9	17.0	0.7	35.0	33.3	33.3	-28.0	28.8	4.9	108.8	132.5	0.50	8.0	2.0
4	25.1	5	27.0	1.6	16.0	2.4	27.8	33.3	33.3	-28.0	22.2	3.6	91.4	104.3	0.42	4.0	2.0
5	25.1	5	29.0	1.0	12.0	0.5	29.3	31.2	31.2	-28.0	21.4	3.1	95.7	98.7	0.43	6.0	2.0
6	25.1	5	40.0	3.1	25.9	3.2	37.1	47.8	47.8	-24.0	35.4	11.5	147.9	169.2	0.57	6.0	2.0
7	5.0	30	28.0	1.1	41.4	2.9	30.0	58.2	58.2	6.0	37.9	8.2	108.8	135.4	0.48	4.0	2.0
8	10.0	5	23.0	1.4	19.0	1.2	21.4	31.2	31.2	-10.0	25.5	7.9	82.7	101.5	0.33	16.0	4.0
9	25.1	5	38.0	0.8	16.0	1.4	30.0	37.4	37.4	-28.0	24.7	6.9	143.6	172.0	0.46	10.0	2.0
10	12.6	10	37.0	4.3	28.9	3.5	34.3	47.8	47.8	-10.0	37.9	12.5	147.9	177.7	0.55	10.0	2.0
11																12.0	4.0
12																8.0	2.0
13																20.0	6.0
14																10.0	2.0
15																12.0	6.0

** DETECTION LIMITS **

COLOUR	- 5.0
DOC	- .5
CA	- 5.0
SO4(MTB)	- 20.8
SO4(IC)	- 10.4
MG	- 8.2
K	- 2.6

SITE A SNOW CHEMISTRY AND WATER CONTENT ON JAN. 12, 1986
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	25.1	5	41.0	0.6	10.5	0.5	19.3	31.2	33.3	-30.0	42.0	3.1	174.0	217.1	0.28	8.0	2.0
2	15.8	5	48.0	2.5	21.0	1.6	7.9	49.9	47.8	-16.0	53.5	7.7	234.9	315.8	0.17	4.0	2.0
3	10.0	10	37.0	2.5	33.4	2.3	4.3	45.8	41.6	-8.0	41.2	9.5	169.7	225.6	0.10	4.0	2.0
4	6.3	10	49.0	2.4	28.9	3.0	0.7	56.2	47.8	10.0	55.1	22.8	252.3	318.7	0.10	2.0	2.0
5	15.8	5	48.0	1.9	22.5	1.5	12.1	49.9	43.7	-14.0	51.0	9.0	230.6	301.7	0.18	4.0	2.0
6	25.1	5	55.0	1.4	24.0	0.9	17.9	52.0	49.9	-26.0	57.6	7.7	243.6	315.8	0.25	8.0	2.0
7	20.0	10	46.0	3.6	21.0	3.2	4.3	47.8	37.4	-14.0	42.8	16.6	204.5	267.9	0.14	10.0	4.0
8	25.1	5	40.0	1.0	11.5	0.5	16.4	39.5	37.4	-28.0	38.7	4.1	169.7	217.1	0.23	8.0	2.0
9	12.6	5	29.0	1.7	12.5	0.9	2.1	31.2	25.0	-14.0	29.6	5.6	117.5	152.3	0.16	10.0	4.0
10	25.1	5	40.0	1.5	10.5	0.7	14.3	39.5	33.3	-28.0	37.9	3.6	161.0	191.8	0.20	14.0	6.0
11	10.0	10	45.0	2.5	32.9	2.6	0.7	60.3	52.0	-6.0	49.4	11.3	200.1	245.3	0.10	4.0	2.0
12	25.1	5	29.0	0.4	9.0	0.5	11.4	31.2	20.8	-22.0	20.6	4.6	104.4	121.3	0.17	14.0	6.0
13	5.0	5	19.0	1.6	11.0	0.5	0.7	25.0	14.6	2.0	18.9	4.4	78.3	95.9	0.10	10.0	4.0
14	25.1	5	26.0	0.5	8.5		17.9	25.0	20.8	-24.0	20.6	2.6	82.7	104.3	0.23	14.0	4.0
15																14.0	4.0

** DETECTION LIMITS **

COLOUR	- 5.0
DOC	- .5
CA	- 5.0
SO4(MTB)	- 20.8
SO4(IC)	- 10.4
MG	- 8.2
K	- 2.6

SITE A SNOW CHEMISTRY AND WATER CONTENT ON FEB. 1, 1986
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	25.1	5	20.0	0.3	5.0	0.5	20.0	20.8	16.6	-28.0	12.3	2.6	47.9	59.2	0.30	14.0	2.0
2	20.0	5	17.0	0.3	5.0	1.4	18.6	20.8	10.4	-24.0	8.2	2.6	34.8	39.5	0.28	8.0	2.0
3	25.1	5	31.0	0.4	9.5	1.2	21.4	22.9	29.1	-30.0	24.7	2.6	95.7	118.4	0.30	8.0	2.0
4	25.1	5	25.0	0.3	7.5	0.8	22.1	20.8	10.4	-32.0	17.3	2.6	65.3	84.6	0.32	8.0	2.0
5	25.1	5	28.0	0.2	10.0	1.4	21.4	22.9	20.8	-30.0	18.9	2.6	78.3	98.7	0.31	8.0	2.0
6	12.6	10	24.0	0.7	24.0	3.0	11.4	41.6	29.1	-10.0	24.7	2.6	78.3	101.5	0.25	10.0	2.0
7	25.1	5	28.0	0.2	6.5	0.5	22.8	20.8	20.8	-30.0	21.4	2.6	78.3	98.7	0.33	10.0	2.0
8	25.1	5	19.0	0.3	5.0	0.5	20.0	20.8	10.4	-30.0	9.9	2.6	39.1	53.6	0.28	12.0	2.0
9	20.0	5	17.0	0.2	5.0	0.5	18.6	20.8	8.3	-24.0	9.1	2.6	34.8	45.1	0.25	12.0	2.0
10	25.1	5	21.0	0.2	5.0	0.5	20.0	20.8	12.5	-32.0	12.3	2.6	47.9	67.7	0.29	10.0	2.0
11	12.6	5	18.0	0.4	12.0	1.2	2.9	22.9	18.7	-10.0	14.8	2.6	56.6	70.5	0.10	6.0	1.0
12	5.0	5	11.7	0.4	8.0	0.5	0.7	20.8	12.5	2.0	10.7	3.1	39.1	47.9	0.10	12.0	2.0
13	20.0	5	14.3	0.2	5.0	0.5	16.4	20.8	8.3	-24.0	8.2	2.6	26.1	31.0	0.22	10.0	2.0
14	20.0	5	17.0	0.2	5.0	0.5	18.6	20.8	12.5	-26.0	9.1	2.6	34.8	42.3	0.25	8.0	2.0
15	20.0	5	17.0	0.2	5.0	0.5	19.3	20.8	12.5	-24.0	9.1	2.6	34.8	42.3	0.25	10.0	2.0

** DETECTION LIMITS **

COLOUR - 5.0
DOC - .5
CA - 5.0
SO4(MTB) - 20.8
SO4(IC) - 10.4
MG - 8.2
K - 2.6

SITE A SNOW CHEMISTRY AND WATER CONTENT ON FEB. 6, 1986
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	12.6	5	12.2	0.2	5.0	0.5	7.1	20.8	10.4	-12.0	8.2	2.6	26.1	39.5	0.15	10.0	2.0
2	10.0	5	14.3	0.3	5.0	0.5	6.4	20.8	10.4	-10.0	13.2	2.6	43.5	59.2	0.11	10.0	2.0
3	15.8	5	15.0	0.2	5.0	0.5	12.1	20.8	14.6	-20.0	9.1	2.6	34.8	45.1	0.19	12.0	2.0
4	10.0	5	14.2	0.4	5.5	0.9	12.9	20.8	16.6	-10.0	10.7	6.4	43.5	56.4	0.22	12.0	2.0
5	12.6	5	12.5	0.3	5.0	0.5	6.4	20.8	16.6	-14.0	9.9	2.6	13.1	47.9	0.11	12.0	2.0
6	10.0	5	66.0	0.4	35.9	0.6	5.0	35.4	33.3	-12.0	8.2	2.6	413.3	507.6	0.16	14.0	2.0
7	15.8	5	21.0	0.3	5.0	0.5	11.4	20.8	16.6	-18.0	18.9	2.6	65.3	84.6	0.19	14.0	2.0
8	7.9	5	7.8	0.2	8.0	0.5	7.9	20.8	10.4	-6.0	8.2	2.6	17.4	28.2	0.15	16.0	4.0
9	10.0	5	7.8	0.2	5.0	0.5	3.6	20.8	10.4	-8.0	8.2	2.6	13.1	25.4	0.11	14.0	2.0
10	15.8	5	12.7	0.2	5.0	0.5	10.0	20.8	10.4	-14.0	8.2	2.6	26.1	36.7	0.16	16.0	4.0
11	6.3	5	5.5	0.3	5.0	0.5	1.4	20.8	10.4	-2.0	8.2	2.6	13.1	19.7	0.10	10.0	2.0
12	7.9	5	5.2	0.2	5.0	0.7	2.9	20.8	10.4	-6.0	8.2	2.6	4.4	14.1	0.10	12.0	2.0
13	15.8	5	10.8	0.3	5.0	0.5	7.1	20.8	16.6	-12.0	8.2	2.6	21.8	33.8	0.12	12.0	2.0
14	7.9	5	5.7	0.2	5.0	0.5	4.3	20.8	10.4	-8.0	8.2	2.6	4.4	14.1	0.10	14.0	4.0
15	6.3	5	4.8	0.2	5.0	0.5	0.7	20.8	10.4	-4.0	8.2	2.6	8.7	14.1	0.10	14.0	4.0

** DETECTION LIMITS **

COLOUR - 5.0
DOC - .5
CA - 5.0
SO4(MTB) - 20.8
SO4(IC) - 10.4
MG - 8.2
K - 2.6

SITE A SNOW CHEMISTRY AND WATER CONTENT ON FEB. 14, 1986
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	20.0	5	17.0	0.2	5.0	0.5	13.6	20.8	12.5	-24.0	11.5	2.6	39.1	53.6	0.18	14.0	4.0
2	12.6	5	14.0	0.5	6.5	0.7	11.4	20.8	12.5	-14.0	10.7	2.6	39.1	47.9	0.18	12.0	4.0
3	12.6	5	17.0	0.3	5.5	0.8	11.4	20.8	14.6	-16.0	14.8	4.9	56.6	64.9	0.18	14.0	2.0
4	15.8	5	16.0	0.3	5.0	0.5	11.4	20.8	14.6	-20.0	12.3	2.6	43.5	56.4	0.17	10.0	4.0
5	7.9	5	9.5	0.4	5.0	0.9	5.0	20.8	10.4	-6.0	8.2	3.6	30.5	36.7	0.11	10.0	4.0
6	15.8	5	21.0	0.4	6.0	1.0	10.0	27.0	20.8	-14.0	21.4	5.4	69.6	93.1	0.16	14.0	2.0
7	12.6	5	12.0	0.7	8.0	1.3	6.4	20.8	12.5	-12.0	9.9	2.6	30.5	39.5	0.16	10.0	2.0
8	12.6	5	9.2	0.3	5.0	0.5	5.0	20.8	12.5	-12.0	8.2	2.6	17.4	22.6	0.11	14.0	2.0
9	7.9	5	8.6	0.5	5.0	1.0	0.7	20.8	12.5	-6.0	8.2	2.6	26.1	33.8	0.10	16.0	2.0
10	10.0	5	7.2	0.3	5.0	0.8	4.3	20.8	10.4	-12.0	8.2	2.6	17.4	19.7	0.10	16.0	4.0
11	10.0	5	10.9	0.4	5.0	1.0	4.3	20.8	12.5	-10.0	8.2	2.6	26.1	39.5	0.10	10.0	4.0
12	6.3	5	7.5	0.5	5.0	1.2	0.7	20.8	12.5	-4.0	8.2	3.1	21.8	28.2	0.10	10.0	4.0
13																10.0	2.0
14																14.0	2.0
15																14.0	2.0

** DETECTION LIMITS **

COLOUR	- 5.0
DOC	- .5
CA	- 5.0
SO4(MTB)	- 20.8
SO4(IC)	- 10.4
MG	- 8.2
K	- 2.6

SITE A SNOW CHEMISTRY AND WATER CONTENT ON FEB. 21, 1986
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	15.8	5	12.9	0.2	5.0	0.5	10.7	20.8	10.4	-18.0	8.2	3.1	34.8	42.3	0.17	10.0	4.0
2	20.0	5	17.0	0.3	5.0	0.9	15.0	20.8	16.6	-20.0	14.0	3.6	47.9	62.0	0.23	8.0	2.0
3	15.8	5	18.0	0.5	13.5	1.1	15.7	20.8	25.0	-14.0	17.3	3.1	60.9	70.5	0.24	8.0	2.0
4	15.8	5	16.0	0.5	12.0	1.3	8.6	20.8	25.0	-14.0	14.0	6.7	56.6	70.5	0.17	6.0	2.0
5	15.8	5	17.0	0.5	10.0	1.2	12.1	20.8	25.2	-16.0	13.2	3.1	56.6	64.9	0.20	6.0	2.0
6	20.0	5	14.2	0.3	5.0	0.5	13.6	20.8	16.6	-24.0	8.2	2.6	30.5	36.7	0.19	8.0	2.0
7	20.0	5	18.0	0.8	5.0	0.9	12.1	20.8	16.6	-18.0	12.3	3.1	52.2	64.9	0.17	8.0	4.0
8	20.0	5	13.9	0.3	5.0	0.5	15.0	20.8	16.6	-18.0	8.2	2.6	30.5	33.8	0.19	10.0	2.0
9	20.0	5	13.4	0.4	5.0	0.5	13.6	20.8	10.4	-18.0	8.2	2.6	30.5	33.8	0.19	8.0	2.0
10	12.6	5	9.5	0.4	5.0	0.5	11.4	20.8	10.4	-12.0	8.2	2.6	26.1	31.0	0.15	10.0	2.0
11	12.6	5	11.9	0.5	5.5	1.0	7.9	20.8	16.6	-14.0	8.2	2.8	34.8	39.5	0.13	6.0	2.0
12	15.8	5	11.1	0.4	5.0	0.7	12.9	20.8	10.4	-18.0	8.2	2.6	8.7	22.6	0.17	10.0	4.0
13	12.6	5	10.7	0.3	5.5	1.5	9.3	20.8	10.4	-16.0	9.1	2.6	26.1	39.5	0.14	8.0	2.0
14	15.8	5	10.9	0.4	5.0	0.5	12.1	20.8	10.4	-14.0	8.2	2.6	13.1	28.2	0.17	10.0	4.0
15	10.0	5	10.1	0.4	5.0	0.9	10.0	20.8	16.6	-8.0	8.2	5.1	26.1	33.8	0.26	10.0	4.0

** DETECTION LIMITS **

COLOUR - 5.0
DOC - .5
CA - 5.0
SO4(MTB) - 20.8
SO4(IC) - 10.4
MG - 8.2
K - 2.6

SITE A SNOW CHEMISTRY AND WATER CONTENT ON FEB. 27, 1986
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	10.0	5	8.3	0.3	5.0	0.5	5.7	20.8	10.4	-10	8.2	2.6	8.7	28.2	0.1	28.0	8.0
2	12.6	5	12.3	0.6	5.5	1.3	7.9	25.0	18.7	-10	14.0	4.1	43.5	53.6	0.1	8.0	2.0
3	10.0	5	9.2	0.6	5.5	0.9	5.7	20.8	12.5	-10	8.2	2.6	17.4	36.7	0.1	18.0	4.0
4	7.9	5	11.7	1.9	9.0	2.6	0.7	20.8	35.4	4	9.9	7.9	34.8	50.8	0.1	16.0	4.0
5	12.6	5	13.0	1.2	8.5	1.0	7.9	25.0	18.7	-12	13.2	3.1	39.1	53.6	0.1	16.0	4.0
6	12.6	5	11.0	1.0	7.0	1.1	7.1	20.8	16.6	-8	9.1	3.3	30.5	42.3	0.1	12.0	2.0
7	12.6	5	10.2	0.8	5.5	0.6	8.6	20.8	12.5	-14	8.2	2.6	17.4	31.0	0.1	18.0	4.0
8	15.8	5	10.2	0.6	5.0	0.8	7.9	20.8	14.6	-12	8.2	2.6	17.4	31.0	0.1	32.0	8.0
9	12.6	5	12.8	0.4	5.0	0.6	10.0	25.0	16.6	-14	9.9	2.6	30.5	42.3	0.1	28.0	8.0
10	10.0	5	10.5	1.0	5.0	1.8	0.7	25.0	10.4	-8	8.2	13.3	26.1	39.5	0.1	28.0	8.0
11	10.0	5	7.6	0.3	5.0	0.5	5.0	20.8	10.4	-12	8.2	2.6	8.7	25.4	0.1	20.0	4.0
12	12.6	5	9.7	0.3	5.0	0.9	5.7	20.8	16.6	-14	8.2	2.6	21.8	33.8	0.1	20.0	4.0
13	12.6	5	9.2	0.3	5.0	0.6	7.1	20.8	10.4	-14	8.2	2.6	17.4	28.2	0.1	24.0	6.0
14	12.6	5	9.8	1.0	5.5	1.1	3.6	20.8	14.6	-10	8.2	3.3	17.4	33.8	0.1	28.0	8.0
15																28.0	6.0

** DETECTION LIMITS **
COLOUR - 5.0
DOC - .5
CA - 5.0
SO4(MTB) - 20.8
SO4(IC) - 10.4
MG - 8.2
K - 2.6

SITE A SNOW CHEMISTRY AND WATER CONTENT ON MAR. 6, 1986
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	12.6	5	8.1	0.4	5.0	0.5	6.4	20.8	8.3	-14.0	8.2	10.2	17.4	19.7	0.10	20.0	6.0
2	12.6	5	12.5	1.0	5.0	2.2	3.6	20.8	8.3	-10.0	9.9	2.6	39.1	47.9	0.10	8.0	2.0
3	15.8	5	16.0	0.4	9.5	0.6	12.1	20.8	16.6	-18.0	11.5	2.6	43.5	53.6	0.18	10.0	2.0
4	12.6	5	15.0	1.1	13.0	2.6	6.4	35.4	20.8	-10.0	14.8	7.7	52.2	62.0	0.10	12.0	4.0
5	12.6	5	13.4	0.8	12.0	1.8	7.1	20.8	16.6	-12.0	12.3	3.8	47.9	59.2	0.10	20.0	8.0
6	10.0	5	11.6	0.6	9.0	1.3	7.9	20.8	16.6	-10.0	11.5	4.1	34.8	45.1	0.13	22.0	8.0
7	12.6	5	14.1	0.8	6.5	1.6	9.3	20.8	14.6	-14.0	12.3	3.3	47.9	56.4	0.14	16.0	6.0
8	15.8	5	13.7	0.6	5.0	0.8	10.0	20.8	25.0	-20.0	9.1	2.6	34.8	42.3	0.14	22.0	6.0
9	12.6	5	12.1	0.6	8.0	1.2	7.1	20.8	18.7	-14.0	10.7	2.6	34.8	42.3	0.10	28.0	8.0
10	15.8	5	13.2	0.4	5.0	0.8	10.7	20.8	20.8	-16.0	9.1	2.6	34.8	42.3	0.14	26.0	8.0
11	12.6	5	13.5	1.0	15.0	2.0	0.7	35.4	8.3	-8.0	11.5	6.4	39.1	47.9	0.10	12.0	4.0
12	12.6	5	9.9	0.4	5.0	0.5	7.1	20.8	12.5	-14.0	8.2	2.6	21.8	31.0	0.10	24.0	8.0
13	12.6	5	10.6	0.6	5.0	1.0	5.0	20.8	8.3	-14.0	8.2	2.6	26.1	36.7	0.10	18.0	6.0
14	12.6	5	10.6	0.4	5.0	0.7	7.9	20.8	14.6	-12.0	8.2	2.6	26.1	36.7	0.10	26.0	8.0
15	10.0	5	11.1	0.3	6.0	0.7	7.9	20.8	18.7	-8.0	9.1	3.8	30.5	42.3	0.11	24.0	8.0

** DETECTION LIMITS **

COLOUR - 5.0
DOC - .5
CA - 5.0
SO4(MTB) - 20.8
SO4(IC) - 10.4
MG - 8.2
K - 2.6

SITE A SNOW CHEMISTRY AND WATER CONTENT ON MAR. 13, 1986
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	10.0	5	6.5	0.6	5.0	0.5	5.0	20.8	10.4	-10.0	8.2	2.6	13.1	19.7	0.10	18.0	6
2	12.6	5	10.0	0.8	5.0	1.1	6.4	20.8	10.4	-12.0	8.2	3.1	30.5	39.5	0.10	10.0	2
3	12.6	5	13.5	1.2	17.0	2.7	7.9	29.1	20.8	-10.0	14.0	4.6	43.5	50.8	0.10	20.0	6
4	12.6	5	12.0	1.0	13.5	2.3	0.7	27.0	16.6	-2.0	11.5	6.7	39.1	47.9	0.10	16.0	4
5	12.6	5	11.1	1.0	6.0	1.1	5.0	20.8	16.6	-10.0	9.1	4.6	30.5	42.3	0.11	22.0	6
6	15.8	5	12.4	1.2	5.0	1.6	8.6	20.8	12.5	-10.0	8.2	2.6	34.8	42.3	0.14	30.0	10
7	15.8	5	12.7	1.1	5.0	0.8	9.3	20.8	16.6	-16.0	8.2	2.6	26.1	36.7	0.13	20.0	6
8	15.8	5	12.3	0.7	6.0	1.1	10.7	20.8	10.4	-20.0	8.2	2.6	26.1	33.8	0.13	26.0	8
9	15.8	5	14.7	0.8	5.0	0.5	12.9	20.8	16.6	-18.0	9.1	2.6	30.5	42.3	0.16	26.0	8
10	15.8	5	14.5	1.1	17.0	2.4	0.7	31.2	25.0	-14.0	12.3	7.2	39.1	47.9	0.10	28.0	12
11	15.8	5	12.3	0.6	5.0	0.6	9.3	20.8	10.4	-20.0	8.2	2.6	26.1	36.7	0.12	16.0	4
12	12.6	5	10.4	0.5	5.0	1.0	7.9	20.8	12.5	-14.0	8.2	2.6	26.1	36.7	0.11	28.0	10
13	15.8	5	14.5	0.6	5.0	1.0	8.6	22.9	16.6	-20.0	8.2	2.6	34.8	45.1	0.13	20.0	6
14	12.6	5	12.4	0.7	5.0	0.8	7.9	20.8	16.6	-12.0	8.2	2.6	30.5	39.5	0.11	26.0	8
15																28.0	8

** DETECTION LIMITS **

COLOUR - 5.0
DOC - .5
CA - 5.0
SO4(MTB) - 20.8
SO4(IC) - 10.4
MG - 8.2
K - 2.6

SITE B SNOW CHEMISTRY AND WATER CONTENT ON DEC. 16, 1985
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	31.6	5	77.0	0.7	22.0	0.6	18.6	72.8	70.7	-34.0	82.3	7.9	378.5	479	0.27	12.0	2.0
2	31.6	5	64.0	0.9	18.0	0.8	15.7	60.3	62.4	-30.0	73.2	7.4	304.5	381	0.20	10.0	2.0
3	25.1	5	48.0	0.6	21.5	0.5	17.9	47.8	47.8	-26.0	52.7	5.1	213.2	265	0.25	12.0	2.0
4	25.1	5	51.0	0.5	20.0	0.6	15.7	47.8	49.9	-26.0	56.8	5.6	221.9	279	0.21	10.0	2.0
5	31.6	5	89.0	0.4	31.9	0.6	20.7	79.0	81.1	-34.0	107.0	10.8	439.4	592	0.31	10.0	2.0
6	25.1	5	64.0	0.8	28.4	1.0	15.7	62.4	64.5	-24.0	75.7	16.1	304.5	398	0.21	10.0	2.0
7	25.1	5	57.0	0.5	19.5	0.6	17.9	54.1	56.2	-24.0	65.0	6.4	265.4	344	0.24	8.0	2.0
8	25.1	5	56.0	0.6	20.0	0.6	19.3	54.1	52.0	-30.0	62.5	6.9	261.0	319	0.26	12.0	2.0
9	5.0	5	43.0	2.2	43.4	1.0	14.3	49.9	52.0	2.0	58.4	6.9	217.5	282	0.19	12.0	2.0
10	15.8	5	32.0	0.6	12.0	0.5	12.9	35.4	37.4	-14.0	37.0	3.1	147.9	175	0.19	12.0	2.0
11	12.6	5	39.0	1.1	25.9	0.6	14.3	43.7	43.7	-8.0	47.7	11.3	191.4	243	0.18	10.0	2.0
12	25.1	5	64.0	0.3	19.5	0.5	17.1	54.1	54.1	-28.0	70.8	7.9	308.9	381	0.22	12.0	2.0
13	25.1	5	50.0	0.6	16.0	0.5	17.9	43.7	43.7	-28.0	52.7	4.6	221.9	268	0.22	10.0	2.0
14	20.0	5	47.0	0.7	16.0	0.8	15.0	43.7	43.7	-20.0	55.1	5.1	226.2	268	0.22	10.0	2.0

** DETECTION LIMITS **

COLOUR	- 5.0
DOC	- .5
CA	- 5.0
SO4(MTB)	- 20.8
SO4(IC)	- 10.4
MG	- 8.2
K	- 2.6

SITE B SNOW CHEMISTRY AND WATER CONTENT ON DEC. 23, 1985
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	39.8	5	46.0	0.3	8.5	0.5	32.1	39.5	39.5	-44.0	40.3	3.1	169.7	220.0	0.45	28.0	6.0
2	39.8	5	46.0	0.3	9.0	0.6	32.8	39.5	39.5	-42.0	42.0	3.1	169.7	228.4	0.43	26.0	6.0
3	25.1	5	44.0	0.3	8.5	0.5	30.0	37.4	35.4	-28.0	37.0	2.6	156.6	208.7	0.42	26.0	8.0
4	39.8	5	63.0	0.4	16.5	0.5	33.6	49.9	47.8	-42.0	52.7	4.6	282.8	366.6	0.49	28.0	8.0
5	39.8	5	47.0	0.3	8.5	0.5	30.7	39.5	29.1	-42.0	39.5	3.1	178.4	225.6	0.43	32.0	10.0
6	31.6	5	63.0	0.5	16.0	0.9	33.6	56.2	49.9	-40.0	66.7	6.9	269.7	372.2	0.47	26.0	6.0
7	39.8	5	38.0	0.3	7.5	0.6	30.7	37.4	33.3	-36.0	31.3	2.6	121.8	163.6	0.41	10.0	2.0
8	31.6	5	29.0	0.3	5.0	0.5	28.6	20.8	20.8	-36.0	17.3	2.6	69.6	95.9	0.39	30.0	6.0
9	39.8	5	52.0	0.4	11.0	0.6	32.8	45.8	39.5	-42.0	47.7	4.1	195.8	265.1	0.44	30.0	8.0
10	39.8	5	42.0	0.4	8.5	0.5	30.7	37.4	33.3	-44.0	34.6	2.6	143.6	203.0	0.41	28.0	6.0
11	39.8	5	47.0	0.3	8.5	0.8	32.8	39.5	35.4	-44.0	38.7	3.1	165.3	222.8	0.44	30.0	8.0
12	39.8	5	42.0	0.3	7.0	0.6	31.4	37.4	33.3	-44.0	32.9	2.6	139.2	186.1	0.43	26.0	8.0
13	39.8	5	52.0	0.3	12.0	0.5	34.3	43.7	39.5	-44.0	47.7	3.6	195.8	259.4	0.49	20.0	6.0
14	39.8	5	47.0	0.3	10.0	0.5	32.8	43.7	39.5	-44.0	41.2	3.3	174.0	228.4	0.46	22.0	8.0
15																30.0	8.0

** DETECTION LIMITS **

COLOUR	- 5.0
DOC	- .5
CA	- 5.0
SO4(MTB)	- 20.8
SO4(IC)	- 10.4
MG	- 8.2
K	- 2.6

SITE B SNOW CHEMISTRY AND WATER CONTENT ON DEC 30, 1985
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	50.1	5	45.0	0.5	10.0	0.8	48.6	29.1	31.2	-56.0	29.6	3	117.5	138.2	0.73	20.0	4.0
2	50.1	5	54.0	0.5	11.0	0.9	47.8	35.4	35.4	-56.0	42.8	3	169.7	205.9	0.72	18.0	6.0
3	31.6	5	40.0	0.7	29.4	1.0	50.0	35.4	33.3	-36.0	37.0	3	121.8	149.5	0.73	20.0	6.0
4	4.0	5	21.0	0.7	33.9	2.0	12.9	25.0	27.0	8.0	29.6	4	87.0	107.2	0.27	18.0	6.0
5	10.0	10	29.0	0.5	38.4	3.8	22.1	31.2	29.1	-8.0	33.7	4	113.1	143.8	0.32	26.0	8.0
6	31.6	5	36.0	0.5	10.5	1.0	37.1	31.2	31.2	-36.0	28.0	3	104.4	129.7	0.55	18.0	4.0
7	20.0	5	36.0	0.5	20.5	0.9	40.7	25.0	33.3	-24.0	39.5	4	121.8	146.6	0.60	14.0	4.0
8	25.1	5	33.0	0.6	10.5	0.9	35.7	20.8	25.0	-30.0	26.3	3	95.7	121.3	0.50	22.0	8.0
9	31.6	5	37.0	0.3	11.5	1.0	34.3	22.9	31.2	-40.0	26.3	3	100.1	126.9	0.51	22.0	8.0
10	31.6	5	37.0	0.4	17.0	0.9	43.6	25.0	31.2	-42.0	31.3	3	104.4	124.1	0.66	26.0	8.0
11	39.8	5	38.0	0.4	10.5	0.5	40.7	25.0	27.0	-48.0	28.8	3	104.4	129.7	0.57	22.0	6.0
12	25.1	5	35.0	0.4	26.9	1.2	39.3	25.0	27.0	-28.0	30.5	3	113.1	132.5	0.53	22.0	6.0
13	31.6	5	40.0	0.5	10.0	0.8	40.7	22.9	27.0	-42.0	29.6	4	117.5	141.0	0.55	10.0	2.0
14	31.6	5	34.0	0.4	18.0	1.3	37.8	22.9	27.0	-30.0	28.0	3	100.1	121.3	0.50	20.0	4.0
15	31.6	5	34.0	0.6	14.0	1.0	37.1	25.0	27.0	-36.0	27.2	3	100.1	126.9	0.53	20.0	6.0

** DETECTION LIMITS **

COLOUR	- 5.0
DOC	- .5
CA	- 5.0
SO4(MTB)	- 20.8
SO4(IC)	- 10.4
MG	- 8.2
K	- 2.6

SITE B SNOW CHEMISTRY AND WATER CONTENT ON JAN. 11, 1986
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	20.0	5	52.0	0.5	15.0		15.0	49.9	37.4	-26.0	57.6	4.9	248.0	293.3	0.21	20.0	8.0
2	12.6	5	27.0	0.6	14.0	0.5	18.6	31.2	31.2	-12.0	30.5	3.6	104.4	132.5	0.27	20.0	6.0
3	20.0	5	37.0	0.5	13.0	0.5	16.4	39.5	29.1	-2.0	37.0	6.9	165.3	203.0	0.24	32.0	8.0
4	15.8	5	32.0	0.8	8.5	0.5	17.9	31.2	27.0	-18.0	30.5	8.4	121.8	160.7	0.37	38.0	12.0
5	25.1	5	49.0	0.5	15.5	0.5	19.3	45.8	45.8	-26.0	54.3	4.9	217.5	270.7	0.27	20.0	6.0
6	10.0	5	36.0	0.6	19.0	0.7	12.1	39.5	39.5	-10.0	43.6	5.4	165.3	211.5	0.18	28.0	8.0
7	15.8	5	48.0	0.5	14.0	0.5	14.3	43.7	43.7	-20.0	55.1	5.4	221.9	296.1	0.21	28.0	8.0
8	20.0	5	59.0	0.6	17.0	0.5	17.9	56.2	56.2	-24.0	67.5	6.1	278.4	349.7	0.26	28.0	8.0
9	12.6	5	48.0	0.7	21.5	0.7	15.0	47.8	47.8	-14.0	57.6	7.9	226.2	293.3	0.22	26.0	6.0
10	15.8	5	44.0	0.9	17.0	0.5	16.4	41.6	41.6	-16.0	51.0	4.9	195.8	251.0	0.23	28.0	8.0
11	20.0	5	36.0	0.5	11.5	0.5	19.3	35.4	29.1	-24.0	34.6	4.4	143.6	174.8	0.26	30.0	8.0
12	20.0	5	57.0	0.4	19.5	0.7	18.6	54.1	49.9	-22.0	65.0	6.4	269.7	338.4	0.25	24.0	8.0
13																22.0	6.0
14																20.0	6.0
15																30.0	8.0

** DETECTION LIMITS **

COLOUR	- 5.0
DOC	- .5
CA	- 5.0
SO4(MTB)	- 20.8
SO4(IC)	- 10.4
MG	- 8.2
K	- 2.6

SITE B SNOW CHEMISTRY AND WATER CONTENT ON FEB. 1, 1986
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	20.0	5	33.0	0.5	13.5	0.5	13.6	29.1	31.2	-18.0	32.9	5.9	121.8	157.9	0.23	16.0	2.0
2	31.6	5	29.0	0.3	6.5	0.5	26.4	20.8	25.0	-40.0	20.6	2.6	78.3	98.7	0.37	16.0	2.0
3	31.6	5	29.0	0.3	5.5	0.5	25.7	20.8	20.8	-40.0	19.8	2.6	74.0	93.1	0.37	14.0	2.0
4	31.6	5	33.0	0.4	9.0	0.5	27.1	27.0	25.0	-30.0	27.2	6.4	108.8	132.5	0.37	16.0	2.0
5	31.6	5	30.0	0.4	7.5	0.5	27.1	20.8	25.0	-34.0	23.9	2.6	82.7	107.2	0.36	12.0	2.0
6	39.8	5	45.0	0.4	10.5	0.5	32.1	35.4	33.3	-42.0	38.7	3.8	147.9	174.8	0.43	10.0	2.0
7	31.6	5	37.0	0.6	11.5	0.5	32.1	25.0	29.1	-40.0	27.2	2.6	104.4	124.1	0.43	14.0	2.0
8	31.6	5	29.0	0.3	5.5	0.5	27.1	20.8	20.8	-38.0	20.6	2.6	78.3	98.7	0.36	10.0	2.0
9	31.6	5	31.0	0.3	6.0	0.5	28.6	20.8	22.9	-36.0	23.0	2.6	87.0	107.2	0.37	12.0	2.0
10																14.0	2.0
11																12.0	2.0
12																12.0	2.0
13																12.0	2.0
14																14.0	2.0
15																14.0	2.0

** DETECTION LIMITS **

COLOUR	- 5.0
DOC	- .5
CA	- 5.0
SO4(MTB)	- 20.8
SO4(IC)	- 10.4
MG	- 8.2
K	- 2.6

SITE B SNOW CHEMISTRY AND WATER CONTENT ON FEB. 6, 1986
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER MM
1	20.0	5	19.0	0.2	5.0	0.5	12.1	20.8	20.8	-22.0	14.0	2.6	52.2	64.9	0.20	10.0	2.0
2	15.8	5	16.0	0.3	5.0	0.5	11.4	20.8	10.4	-18.0	11.5	2.6	43.5	53.6	0.17	12.0	2.0
3	20.0	5	20.0	0.2	5.0	0.5	15.0	20.8	16.6	-18.0	16.5	2.6	56.6	76.1	0.22	12.0	2.0
4	20.0	5	17.0	0.2	5.0	0.5	12.9	20.8	10.4	-22.0	11.5	2.6	43.5	50.8	0.19	12.0	2.0
5	15.8	5	16.0	0.2	5.0	0.5	12.1	20.8	12.5	-18.0	13.2	2.6	43.5	56.4	0.17	14.0	4.0
6	20.0	5	20.0	0.3	5.0	0.5	12.9	20.8	10.4	-18.0	16.5	2.6	56.6	70.5	0.19	12.0	2.0
7	12.6	5	11.7	0.2	5.0	0.6	8.6	20.8	10.4	-12.0	9.1	2.6	26.1	39.5	0.12	12.0	2.0
8	15.8	5	15.0	0.2	5.0	0.5	10.7	20.8	10.4	-18.0	12.3	2.6	43.5	56.4	0.15	12.0	2.0
9	20.0	5	18.0	0.2	5.0	0.5	13.6	20.8	16.6	-22.0	14.0	2.6	47.9	59.2	0.19	14.0	2.0
10	15.8	5	14.7	0.2	5.0	0.5	11.4	20.8	10.4	-16.0	10.7	2.6	34.8	45.1	0.17	14.0	2.0
11	15.8	5	13.9	0.2	5.0	0.5	10.7	20.8	10.4	-18.0	9.9	2.6	30.5	42.3	0.16	10.0	2.0
12	20.0	5	17.0	0.2	5.0	0.5	14.3	20.8	10.4	-20.0	12.3	2.6	43.5	56.4	0.19	10.0	2.0
13	15.8	5	12.8	0.2	5.0	0.5	10.0	20.8	10.4	-18.0	8.2	2.6	26.1	33.8	0.15	10.0	2.0
14																12.0	2.0
15																12.0	2.0

** DETECTION LIMITS **

COLOUR	- 5.0
DOC	- .5
CA	- 5.0
SO4(MTB)	- 20.8
SO4(IC)	- 10.4
MG	- 8.2
K	- 2.6

SITE B SNOW CHEMISTRY AND WATER CONTENT ON FEB. 14, 1986
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	20.0	5	17.0	0.3	5.0	0.5	12.9	20.8	16.6	-18.0	10.7	2.6	43.5	53.6	0.20	10.0	4.0
2	20.0	5	21.0	0.4	5.0	0.5	13.0	20.8	16.6	-22.0	14.8	2.6	60.9	76.1	0.23	10.0	4.0
3	20.0	5	22.0	0.2	5.5	0.5	15.7	20.8	16.6	-24.0	16.5	2.6	60.9	76.1	0.24	10.0	2.0
4	20.0	5	19.0	0.2	5.0	0.5	14.3	20.8	16.6	-24.0	13.2	2.6	52.2	62.0	0.22	12.0	4.0
5	20.0	5	18.0	0.2	5.0	0.5	14.3	20.8	16.6	-20.0	13.2	2.6	56.6	64.9	0.21	10.0	4.0
6	15.8	5	16.0	0.3	5.5	0.5	10.7	20.8	16.6	-16.0	11.5	2.6	52.2	56.4	0.18	10.0	2.0
7	20.0	5	17.0	0.2	5.0	0.5	13.6	20.8	16.6	-20.0	11.5	2.6	43.5	56.4	0.22	10.0	2.0
8	15.8	5	20.0	0.3	6.5	0.5	13.6	20.8	16.6	-18.0	17.3	2.6	65.3	81.8	0.22	8.0	2.0
9	20.0	5	20.0	0.2	6.5	0.5	15.0	20.8	16.6	-18.0	16.5	2.6	60.9	70.5	0.24	10.0	2.0
10	20.0	5	16.0	0.2	5.0	0.5	12.9	20.8	16.6	-18.0	9.9	2.6	39.1	50.8	0.20	12.0	4.0
11	15.8	5	16.0	1.7	5.5	0.5	13.6	20.8	12.5	-14.0	13.2	2.6	39.1	53.6	0.21	12.0	4.0
12	12.6	5	12.3	0.2	5.0	0.5	9.3	20.8	16.6	-16.0	8.2	2.6	30.5	36.7	0.15	12.0	4.0
13	15.8	5	14.0	0.2	5.0	0.5	12.1	20.8	20.8	-16.0	9.1	2.6	34.8	45.1	0.17	10.0	2.0
14	15.8	5	13.9	0.2	5.0	0.5	12.1	20.8	12.5	-20.0	8.2	2.6	34.8	42.3	0.17	10.0	2.0
15																10.0	2.0

** DETECTION LIMITS **

COLOUR	- 5.0
DOC	- .5
CA	- 5.0
SO4(MTB)	- 20.8
SO4(IC)	- 10.4
MG	- 8.2
K	- 2.6

SITE B SNOW CHEMISTRY AND WATER CONTENT ON FEB. 21, 1986
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURBID. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	20.0	5.0	16.0	0.3	4.990	0.5	14.3	20.8	20.8	-20.0	9.9	2.6	34.8	50.8	0.20	10.0	2.0
2	25.1	5.0	23.0	0.3	4.990	0.5	20.7	25.0	20.8	-26.0	14.0	2.6	60.9	73.3	0.29	16.0	4.0
3	20.0	5.0	17.0	0.3	5.489	0.5	15.7	20.8	20.8	-24.0	9.9	2.6	43.5	56.4	0.20	14.0	4.0
4	20.0	5.0	21.0	0.3	6.487	0.5	18.6	25.0	20.8	-24.0	13.2	2.6	56.6	64.9	0.26	14.0	4.0
5	20.0	5.0	18.0	0.4	5.489	1.0	15.7	22.9	20.8	-22.0	10.7	2.6	43.5	53.6	0.22	16.0	4.0
6	20.0	5.0	19.0	0.5	8.982	0.9	17.1	25.0	20.8	-22.0	14.0	2.6	56.6	64.9	0.24	14.0	4.0
7	20.0	5.0	20.0	0.3	4.990	0.5	18.6	22.9	20.8	-26.0	13.2	2.6	56.6	64.9	0.24	12.0	4.0
8	25.1	5.0	19.0	0.2	4.990	0.5	17.9	25.0	16.6	-22.0	10.7	2.6	43.5	53.6	0.24	8.0	2.0
9	20.0	5.0	16.0	0.2	4.990	0.5	16.4	25.0	10.4	-22.0	8.2	2.6	34.8	47.9	0.22	10.0	2.0
10	20.0	5.0	16.0	0.2	4.990	0.5	15.0	20.8	16.6	-24.0	9.9	2.6	30.5	47.9	0.20	10.0	4.0
11	20.0	5.0	18.0	0.2	4.990	0.5	17.1	20.8	16.6	-22.0	11.5	2.6	43.5	56.4	0.23	10.0	4.0
12	25.1	5.0	17.0	0.3	4.990	0.5	16.4	20.8	16.6	-26.0	8.2	2.6	34.8	42.3	0.22	10.0	6.0
13																10.0	4.0
14																8.0	2.0
15																12.0	4.0

** DETECTION LIMITS **
COLOUR - 5.0
DOC - .5
CA - 5.0
SO4(MTB) - 20.8
SO4(IC) - 10.4
MG - 8.2
K - 2.6

SITE B SNOW CHEMISTRY AND WATER CONTENT ON FEB. 27, 1986
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER MM
1	12.6	5	21.0	0.3	5.5	0.5	7.1	20.8	20.8	-14.0	22.2	2.6	87.0	107.2	0.10	34.0	10.0
2	10.0	5	15.0	0.3	5.0	0.7	7.1	20.8	14.6	-14.0	16.5	2.6	56.6	70.5	0.11	24.0	8.0
3	12.6	5	16.0	0.2	5.5	0.7	7.1	20.8	14.6	-12.0	13.2	2.6	56.6	67.7	0.10	36.0	10.0
4	12.6	5	13.6	0.2	5.0	0.5	6.4	20.8	12.5	-14.0	13.2	2.6	43.5	59.2	0.10	38.0	12.0
5	10.0	5	13.5	0.2	5.0	0.5	6.4	20.8	12.5	-12.0	11.5	2.6	47.9	56.4	0.10	38.0	10.0
6	12.6	5	14.7	0.4	5.0	0.8	7.9	20.8	18.7	-12.0	12.3	2.6	52.2	64.9	0.21	42.0	12.0
7	10.0	5	10.8	0.2	5.0	0.5	5.7	20.8	14.6	-10.0	8.2	2.6	34.8	45.1	0.10	38.0	10.0
8	12.6	5	14.2	0.4	5.0	1.1	6.4	20.8	18.7	-10.0	13.2	3.8	56.6	67.7	0.10	36.0	10.0
9	12.6	5	13.7	0.3	5.0	0.5	7.1	20.8	10.4	-14.0	10.7	2.6	43.5	56.4	0.10	32.0	8.0
10	10.0	5	11.2	0.2	5.0	0.5	3.6	20.8	14.6	-10.0	9.1	2.6	39.1	45.1	0.10	48.0	12.0
11	10.0	5	11.0	0.2	5.0	0.5	6.4	20.8	18.7	-14.0	8.2	2.6	34.8	42.3	0.10	52.0	14.0
12	12.6	5	12.0	0.2	5.0	0.5	6.4	20.8	14.6	-14.0	8.2	2.6	34.8	45.1	0.10	26.0	6.0
13	10.0	5	11.4	0.3	5.0	0.7	3.6	20.8	10.4	-10.0	9.9	2.6	39.1	47.9	0.10	32.0	10.0
14	12.6	5	12.1	0.2	5.0	0.5	6.4	20.8	10.4	-12.0	8.2	2.6	39.1	45.1	0.08	36.0	10.0
15																38.0	10.0

** DETECTION LIMITS **

COLOUR	- 5.0
DOC	- .5
CA	- 5.0
SO4(MTB)	- 20.8
SO4(IC)	- 10.4
MG	- 8.2
K	- 2.6

SITE B SNOW CHEMISTRY AND WATER CONTENT ON MAR. 6, 1986
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA		NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	WATER CM
1	10.0	5	9.0	0.2	5.0	0.5	5.7	20.8	10.4	-12.0	8.2	2.6	21.8	33.8	0.10	8.0
2	15.8	5	20.0	0.3	5.5	0.5	10.7	20.8	20.8	-16.0	17.3	2.6	65.3	84.6	0.14	10.0
3	15.8	5	18.0	0.3	6.0	0.6	10.0	20.8	18.7	-16.0	15.6	2.6	56.6	73.3	0.13	6.0
4	12.6	5	16.0	0.2	5.0	0.6	10.0	20.8	18.7	-14.0	11.5	7.2	43.5	59.2	0.18	8.0
5	12.6	5	17.0	0.2	5.0	0.5	8.6	20.8	18.7	-10.0	15.6	2.6	60.9	76.1	0.11	8.0
6	12.6	5	14.3	0.3	5.5	0.6	9.3	20.8	18.7	-10.0	12.3	2.6	47.9	59.2	0.11	8.0
7	12.6	5	17.0	0.2	5.0	0.5	9.3	20.8	18.7	-18.0	13.2	2.6	56.6	70.5	0.11	10.0
8	12.6	5	16.0	0.8	7.5	0.7	7.9	20.8	18.7	-10.0	15.6	2.6	56.6	73.3	0.10	10.0
9	12.6	5	10.9	0.3	5.0	0.5	7.1	20.8	10.4	-14.0	8.2	2.6	30.5	39.5	0.10	6.0
10	10.0	5	9.1	0.2	5.0	0.5	5.0	20.8	10.4	-10.0	8.2	2.6	26.1	36.7	0.10	4.0
11	7.9	5	8.3	0.2	5.0	0.5	6.4	20.8	10.4	-8.0	8.2	2.8	21.8	31.0	0.10	12.0
12	12.6	5	11.0	0.2	5.0	0.5	7.9	20.8	12.5	-16.0	8.2	2.6	21.8	33.8	0.10	8.0
13	12.6	5	10.8	0.3	5.0	0.5	8.6	20.8	10.4	-14.0	8.2	2.6	21.8	33.8	0.11	8.0
14	10.0	5	10.9	0.3	6.0	0.5	8.6	20.8	14.6	-10.0	9.1	2.6	30.5	45.1	0.10	10.0
15																8.0

** DETECTION LIMITS **

COLOUR	- 5.0
DOC	- .5
CA	- 5.0
SO4(MTB)	- 20.8
SO4(IC)	- 10.4
MG	- 8.2
K	- 2.6

SITE B SNOW CHEMISTRY AND WATER CONTENT ON MAR. 14, 1986
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB. JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER MM
1	13	5	10.0	0.5	5.0	0.5	7.9	20.8	10.4	-14.0	8.2	2.6	21.8	31.0	0.1	30.0	10.0
2	16	5	14.9	0.5	5.0	0.5	11.4	20.8	16.6	-20.0	8.2	2.6	34.8	42.3	0.1	38.0	12.0
3	16	5	16.0	0.7	5.0	0.5	7.9	20.8	18.7	-16.0	12.3	2.6	43.5	53.6	0.1	34.0	10.0
4	13	5	12.9	0.5	5.0	0.5	9.3	20.8	22.9	-14.0	8.2	2.6	30.5	42.3	0.1	26.0	8.0
5	16	5	16.0	0.5	5.0	0.5	12.1	20.8	16.6	-20.0	9.9	2.6	39.1	47.9	0.2	38.0	12.0
6	16	5	21.0	1.0	5.0	0.6	10.7	25.0	18.7	-20.0	18.1	2.6	69.6	81.8	0.1	40.0	12.0
7	16	5	20.0	0.4	5.5	0.5	11.4	22.9	18.7	-20.0	17.3	3.1	69.6	81.8	0.1	40.0	12.0
8	16	5	27.0	0.7	9.5	0.5	11.4	27.0	20.8	-18.0	12.3	2.6	126.2	129.7	0.2	16.0	4.0
9	16	5	11.5	0.6	5.0	0.5	8.6	20.8	12.5	-14.0	8.2	2.6	26.1	36.7	0.1	40.0	12.0
10	16	5	15.0	0.5	5.0	0.5	10.7	20.8	12.5	-18.0	10.7	2.6	39.1	50.8	0.1	38.0	12.0
11	10	5	18.0	0.6	12.5	0.5	10.7	20.8	18.7	-12.0	13.2	2.6	69.6	84.6	0.1	32.0	8.0
12	20	5	20.0	0.6	5.0	0.5	11.4	20.8	20.8	-20.0	15.6	2.6	65.3	79.0	0.1	32.0	8.0
13	16	5	21.0	0.7	5.0	0.5	12.1	20.8	22.9	-20.0	17.3	2.6	65.3	79.0	0.2	28.0	10.0
14	16	5	13.9	0.4	5.0	0.5	0.7	20.8	14.6	-14.0	9.1	2.6	39.1	47.9	0.1	24.0	10.0
15	20	5	22.0	0.9	5.0	0.6	10.0	20.8	22.9	-20.0	17.3	2.6	69.6	84.6	0.2	18.0	8.0

** DETECTION LIMITS **

COLOUR - 5.0
DOC - .5
CA - 5.0
SO4(MTB) - 20.8
SO4(IC) - 10.4
MG - 8.2
K - 2.6

SITE B SNOW CHEMISTRY AND WATER CONTENT ON MAR. 21, 1986
(VALUES IN UEQ/L)

STN	H+	COLOUR R. U.	COND. US/CM	TURB JTU	CA	DOC MG/L	NOX	SO4 MTB	SO4 IC	ALK	MG	K	NA	CL	NTOTAL MG/L	SNOW CM	WATER CM
1	7.9	5	6.7	1.5	5.0	0.5	3.6	20.8	10.4	-8.0	8.2	2.6	21.8	31.0	0.10	12.0	4.0
2	6.3	5	5.3	1.7	5.0	0.5	2.1	20.8	10.4	-6.0	8.2	2.6	17.4	25.4	0.10	8.0	2.0
3	7.9	5	7.1	1.5	5.0	0.5	3.6	20.8	10.4	-6.0	8.2	2.6	21.8	31.0	0.10	20.0	6.0
4	7.9	5	7.4	1.0	5.0	0.5	2.9	20.8	10.4	-8.0	8.2	2.6	21.8	33.8	0.10	16.0	4.0
5	12.6	5	12.5	0.6	5.0	0.5	7.9	20.8	22.9	-14.0	8.2	2.6	39.1	50.8	0.10	18.0	6.0
6	7.9	10	8.7	0.8	5.0	0.8	2.9	20.8	10.4	-8.0	8.2	4.4	30.5	42.3	0.10	26.0	12.0
7	7.9	5	9.4	0.8	5.0	0.6	3.6	20.8	10.4	-6.0	8.2	11.0	30.5	45.1	0.10	32.0	10.0
8	7.9	5	8.8	1.3	5.0	0.5	2.1	20.8	10.4	-6.0	8.2	5.6	30.5	42.3	0.10	12.0	2.0
9	7.9	5	5.9	1.4	5.0	0.5	3.6	20.8	10.4	-8.0	8.2	2.6	17.4	25.4	0.10	22.0	6.0
10	10.0	5	7.6	0.5	5.0	0.5	5.7	20.8	10.4	-10.0	8.2	2.6	17.4	25.4	0.10	28.0	8.0
11	10.0	5	8.1	1.2	5.0	~0.5	5.7	20.8	10.4	-10.0	8.2	2.6	21.8	33.8	0.10	18.0	4.0
12	6.3	5	5.0	1.1	5.0	0.5	2.1	20.8	10.4	-6.0	8.2	2.6	13.1	19.7	0.10	12.0	4.0
13	10.0	5	8.8	0.6	5.0	0.5	3.6	20.8	10.4	-10.0	8.2	2.6	30.5	39.5	0.10	26.0	6.0
14	10.0	5	8.2	0.7	5.0	0.5	5.7	20.8	10.4	-12.0	8.2	2.6	21.8	28.2	0.10	24.0	8.0

** DETECTION LIMITS **

COLOUR	- 5.0
DOC	- .5
CA	- 5.0
SO4(MTB)	- 20.8
SO4(IC)	- 10.4
MG	- 8.2
K	- 2.6